

**The Complete
Tom Swift Home Page**

The Complete Tom Swift Home Page

Including:

The Complete Tom Swift Home Page

The Complete Tom Swift Jr. Home Page

The Complete Dig Allen Home Page

Edited by Jonathan Cooper

First Edition
08/13/2010

This book is respectfully dedicated to the many, many people that helped me assemble this amazing Tom Swift guide. Chronicling every Tom Swift Jr. and Sr. book was a monumental task, and I could not have done it without the assistance of the many people who stepped forward to lend a hand. Some contributed cover scans or words of advice, while others contributed entire summaries.

In fact, there were so many contributors that it is impossible to list all of them here. However, their contributions are mentioned throughout the book, and credit is given where credit is due. I took pains to make sure that no one was left out.

Once again, thank you so much for making this guide possible. Exploring the world of Tom Swift has been incredibly fun – I've discovered new worlds, met amazing people, and formed relationships that have lasted for years. It has been fantastic.

In the following pages you will find the Complete Tom Swift Home Page, compiled into a single volume. I have resisted the urge to edit the pages and have left them as they are. The website was assembled over many years; I believe construction started in late 1997 or early 1998, and continued through 2007. It took ten years to assemble this information.

The summaries were not written in any particular order. There were many summaries I was not able to write simply because I didn't own copies of those books. The last Tom Swift Jr. summary that was written was the one for *Tom Swift and His Electronic Hydrolung*.

I hope you enjoy this stroll through time. The Tom Swift books are from a different era – one, sadly, that is now long past. They were good books, and I enjoyed exploring Tom's world. I hope you will as well.

-- Jonathan Cooper
<http://www.tomswift.info/>

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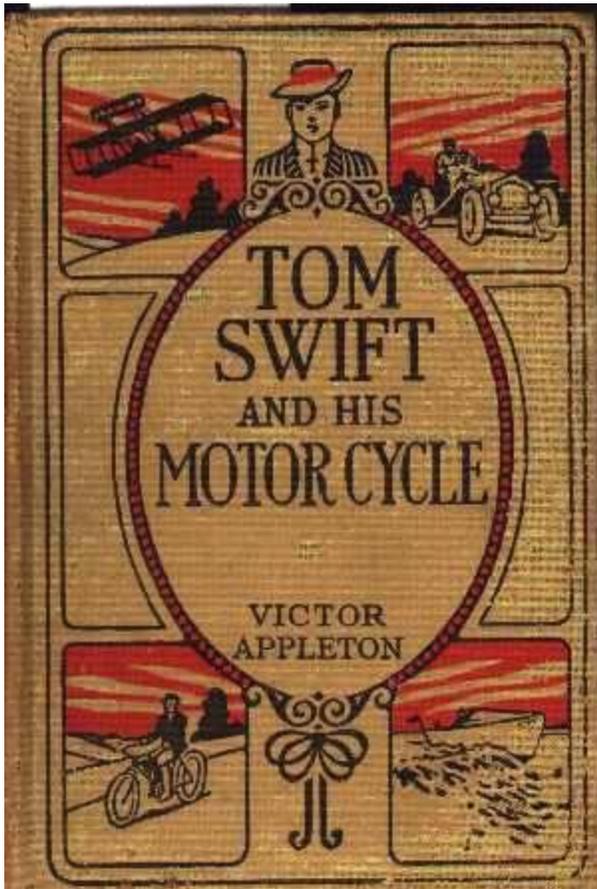
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The Complete Tom Swift Sr. Home Page



From a Tom Swift dustjacket: "It is the purpose of these spirited tales to convey in a realistic way the wonderful advances in land and sea locomotion and to interest the boy of the present in the hope that he may be a factor in aiding the marvelous development that is coming in the future."

Hi! Welcome to the Complete Tom Swift Sr. Home Page. Tom Swift Sr., for those who don't know, is the very first of the famous Swift family. His books, combined with the ones concerning his son, make up what may be the most famous books concerning scientific inventors in all juvenile literature. The series that he starred in appeared in 1910 and lasted for 40 books, finally, and sadly, ending in 1941.

The purpose of this page is exactly the same as the purpose of my Tom Swift Jr. page, only with a twist. Many of the inventions that were talked about, dreamed of, and built in these books have indeed been built. However, were they built as the book predicted? What impact did they have when they were built? And what about those odd inventions (such as the Electric Rifle) that never came about -- are they practical or possible in any way?

The Tom Swift Sr. books are, in the order they were written:

1. Tom Swift and His Motor Cycle (1910)
2. Tom Swift and His Motor Boat (1910)
3. Tom Swift and His Airship (1910)
4. Tom Swift and His Submarine Boat (1910)
5. Tom Swift and His Electric Runabout (1910)
6. Tom Swift and His Wireless Message (1911)
7. Tom Swift Among the Diamond Makers (1911)
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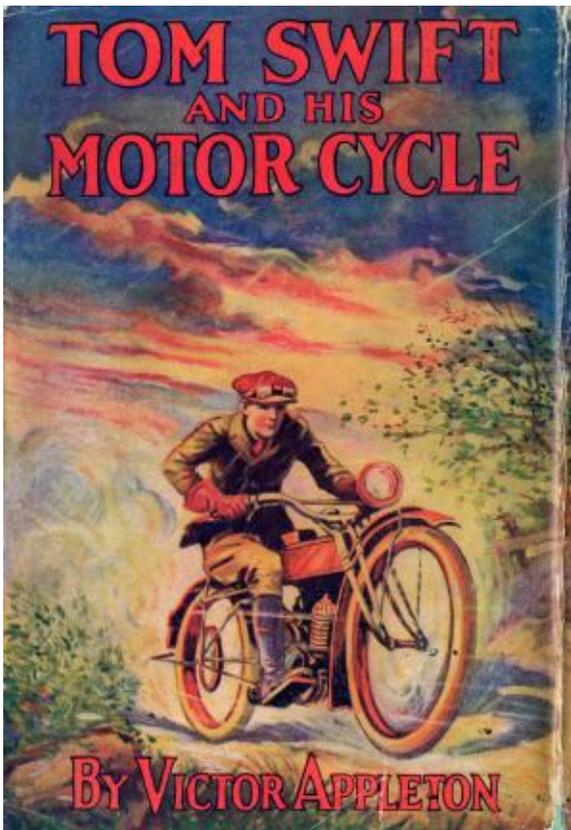
#1. Tom Swift and His Motor-Cycle (1910)

Or, Fun Adventures on the Road

Review by JP Karenko, 3/28/05, Updated August 2006

Full-color image from the collection of James D. Keeline

Duotone, White Quad and Brown Quad images from the collection of Mark Snyder



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

The book opens with Tom on an errand for his father. He is on a bicycle, and is nearly run down by one Andy Fogger, a red-haired squinty-eyed bully, who is trying to get his new automobile to go as fast as possible. Andy ends up in a ditch, and blames Tom. (This may be the first documented case of "road-rage.") Later on that same trip, Tom encounters one Wakefield Damon, who crashes *his* new motor-cycle against a tree near Tom's house and is injured. Tom buys the wreck and repairs it, thus leading to his *Adventures on the Road*.

Tom was been given charge by his father of delivering important patent documents and a proof-of-concept model to an attorney in distant Albany, NY. Those documents, along with the model, a new turbine engine developed by Tom's father Barton, are the central anchor around which the rest of the story revolves.

Barton's turbine design and model are stolen by a gang, posing as tramps. The gang are hired by frustrated investors, seeking to "get ahead" of Barton and capitalize on the new design. The gang attacks Tom and drugs him during his road trip to Albany. Tom escapes, and after some serious detective work, finds the bad-guys' hideout. With the help of Mr. Damon and several other men, Tom recovers the stolen items. The bad guys slip away in the confusion, to return in future episodes.

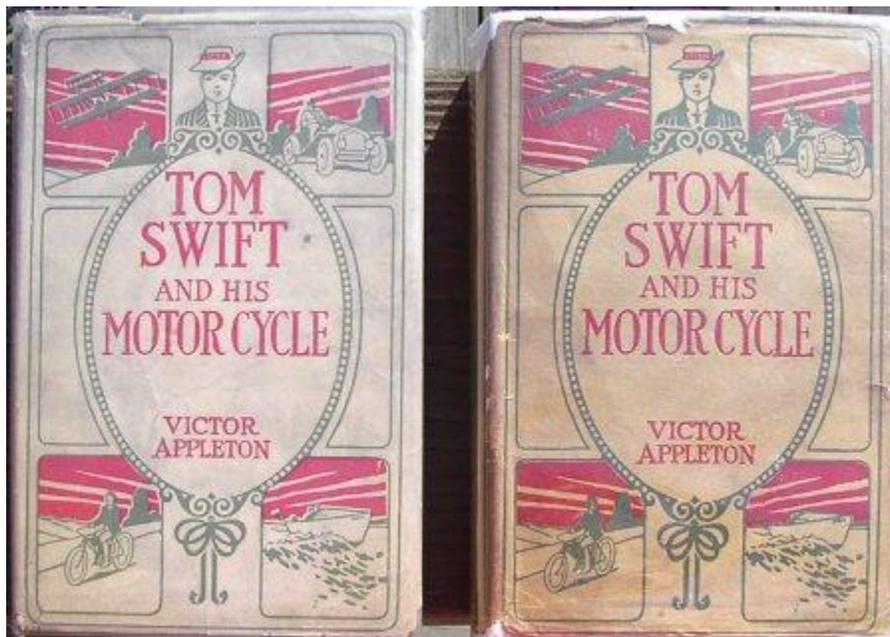
Dustjackets

The dustjackets for the Grosset & Dunlap editions of the original Tom Swift books came in a variety of formats. The first format (which is almost impossible to find) was printed on plain brown paper; the design of the jacket matched the cover of the book itself but the design was done entirely in red ink. The second format (Brown Quad II) was also printed on brown paper but it had two colors: red and green, with the outline being in green and the red being used as shading. The third format (White Quad) was identical to Brown Quad II except for the fact that the paper the jacket was printed upon was white instead of brown.

After these formats came the Duotone Dustjacket, which features an image on the cover depicting the book in some way. The image was not full-color, however, but instead was a mixture of browns and grays. The image almost looked like it was a faded color image but, in fact, it was not. Sometime after this was released the Full Color Dustjacket came out, which featured an image in full-color that was almost, but not exactly, the same as the image from the Duotone Dustjacket.

The Type I Brown Quad dustjackets are all but impossible to find. The Type II Brown Quad dustjackets are quite hard to find but do exist. The White Quad dustjackets are easier to find, but not as easy to find as the Duotone Dustjackets. By far, however, the most common dustjackets are the Full Color dustjackets.

Below is a picture of a White Quad dustjacket next to a Type II Brown Quad. The image comes from the book collection of Mark Snyder. Thanks, Mark!



Throughout this Tom Swift website you will find pictures of all the dustjacket formats; where images were available I tried to provide pictures of the brown quad, white quad, duotone, and full color dustjacket.

Cast of Characters (More or less in order of appearance)

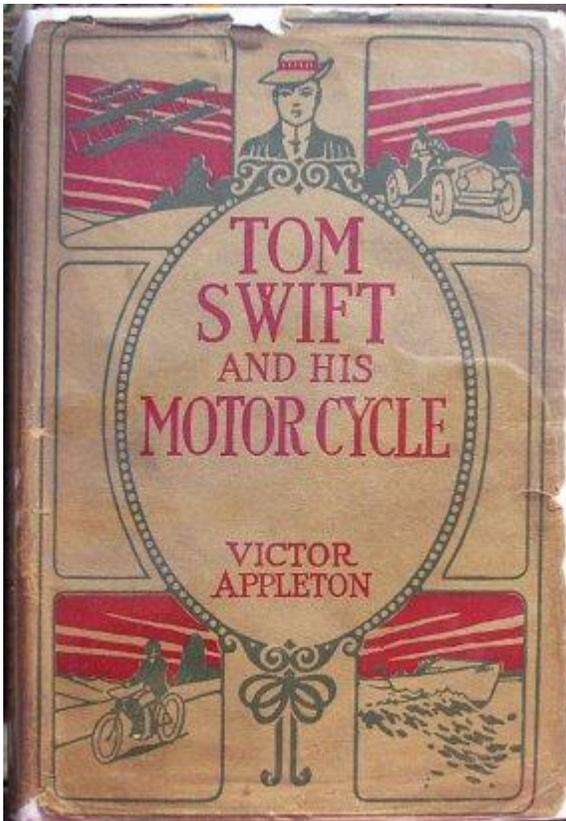
Andy Fogger--Red haired, squinty-eyed bully, who makes great trouble for Tom. "Poor little rich kid." Son of wealthy family and born with a chip on his shoulder. Reckless, blustery and angry. A showoff.

Sam Snedecker--Cohort of Andy Fogger. Voice of reason to Andy's scream of rage. No description given.

Unnamed 3rd & 4th cohorts--Passengers in Andy's car. No names or descriptions.

Tom Swift--Intrepid inventor & mechanical genius. Plucky, resourceful, brave and clever. (handsome, too...) Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things scientific.

Barton Swift--Widower. Wealthy but conservative and not flashy or pretentious. Inventor master machinist and holder of numerous patents. Elderly and in poor health from overwork.



Mrs. Baggert--Housekeeper and surrogate mother to Tom. Employed by the Swift family for 10 years at the time of this story. She is kindly and like a 2nd mother to Tom. Willing to feed tramps that come by looking for a meal.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. He nearly runs Tom off the road, while trying to control his new Motor-Cycle, and is later injured when the machine tries to "climb a tree." In this tome, he "resides in nearby Waterfield," and suffers from "liver ailments." Self-described as "too stout to walk," and "cannot run." Apparently quite wealthy.

Mr. Merton--NFN (No First Name) given. Contract machinist in Mansburg, who makes special-order parts for the Swifts. Suspected leak for some of Swifts' secrets.

Smeak & Katch--Unscrupulous Washington D.C. law firm, employed by unnamed financier(s) that try to steal Barton Swift's turbine.

Reid & Crawford--Scrupulous Washington D.C. law firm representing Barton Swift.

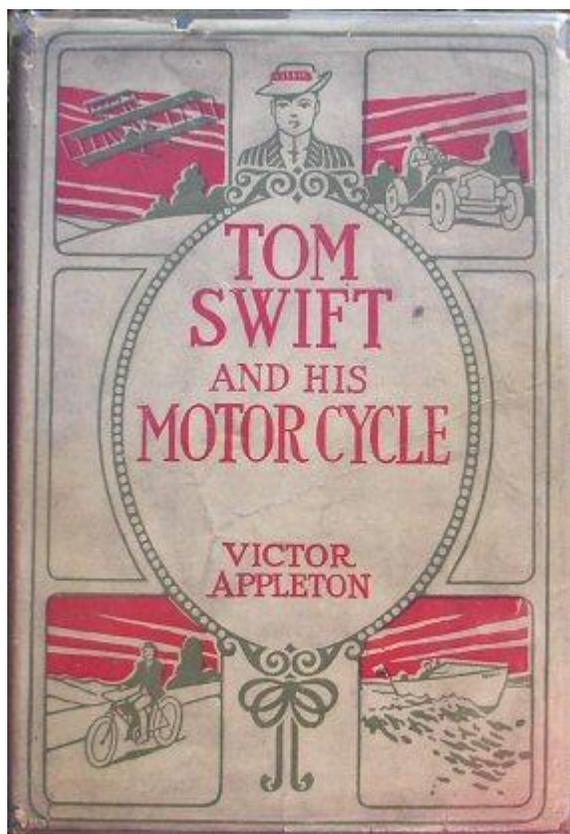
The "Happy Harry" Gang--Not named as such, but surmised from the description of the four members. These guys show up singly and in groups throughout this story, and later.

Jake Burke, A.K.A. "Happy Harry"--Ringleader & brains of the outfit. Educated, and plays the part of a tramp, but poorly. Bushy brown beard, and tattoo of a ring on the small finger of his left hand. Hired as sneak-thief and industrial spy by unnamed "financiers" trying to steal Barton Swift's turbine plans.

Anson Morse--"Snappy dresser" who wears kid gloves. Black moustache. Uses a false beard while playing the part of a bum, trying to steal the turbine plans. A sneak-thief who steals papers from Swift property.

Featherston, A.K.A. "Simpson"--NFN given. Thug / muscle for gang. Knows knockout techniques and drugs. Acts as chauffeur/driver for the gang.

Appleson--NFN given. Thug / muscle for gang.



Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro journeyman jack-of-all-trades. Chicken-coop cleaner and whitewasher. "Eradicates dirt." Also makes a living mowing grass, and sawing wood. Gives the appearance of being lazy, but is actually a hard worker and entrepreneur/wheeler-dealer. Heavy deep-south accent and Uncle Remus attitude. Caretaker of mule **Boomerang**.

Miss Mary Nestor--Saved by Tom when her horse & wagon run away. Cameo appearance, early in story. Described as a "fair young woman." Resides in Mansburg, with her father, Amos.

Amos Nestor-- Mary's father. Passing mention only.

Ned Newton--Chum & soon-to-be constant companion of Tom, is currently employed in a Shopton bank. Does not appear in this story.

Garrett Jackson--Aged "engineer" who runs and maintains the steam plant and engine(s) used to power the Swift's belt-driven machine tools. Lives in a shack on the Swift property.

Theodore Duncan--Hunter who aids Tom after his Motor-Cycle is sabotaged by Happy Harry.

Blackford Family--Farm family who render aid to Tom after he is waylaid by Happy Harry Gang.

Amos Blackford--Farmer & Head of Household.

Mrs. Blackford--NFN given. Wife of Amos, kindly & compassionate toward Tom.

Jeb Blackford--Son of Amos, farmer & part-time Deputy Sheriff.

Vigilantes--Touring chums of Wakefield Damon.

Messrs. Munson, Dwight & Benson--Brave, but inept impromptu posse that help Tom recover the plans and patent model. Bad guys escape in spite of being surrounded.

Major Inventions

Tom Swift didn't really "invent" anything in this book. He did do some engineering development work on his new toy, though, by changing sprocket ratios and improving the gasoline and spark levers on his cycle. These changes, along with a larger fuel tank, improved the performance of the machine, increasing the range and the stated top speed by some 15%. Tom's cycle had pedals, which were used to get the bike up to a speed where the clutch could be let out, thus starting the motor. Kick starters and electric assist had not yet been thought-of. Cost of such a machine was in the \$200-250 range.

Makes more than a mile a minute!
Yet safe for a ten-year boy to ride

Any ten-year boy can ride an Excelsior safely because it's simplest, easiest machine to run. Clutch operated by left-hand grip—throttle by right.

Excelsior only motorcycle with entire control in handle bars—holds World's Speed Records, yet not built for racing. All victories, won with stock design engine—same as in machine you buy—prove its power and easy riding.

Parents—Keep your boys at home—buy them Excelsiors—they'll be contented. Write today for catalog.

Excelsior Single, 4-5 H. P., price \$200
Excelsior Twin, 7-10 H. P., price \$250

Excelsior Motor Mfg. & Supply Co.
Dept. A Chicago

EXCELSIOR World's Records	
1 mile, 36 sec. flat	
First motorcycle to attain a speed of 100 miles an hour.	
2 miles	1.12 4-5
3 miles	1.50 3-5
4 miles	2.29 4-5
5 miles	3.07 3-5
10 miles	6.18
30 miles	20.18 1-5
50 miles	33.55 1-5
75 miles	50.55 2-5
100 mi.	68.01 4-5



Few good agents wanted

1910 era Motor Cycle Advertisement

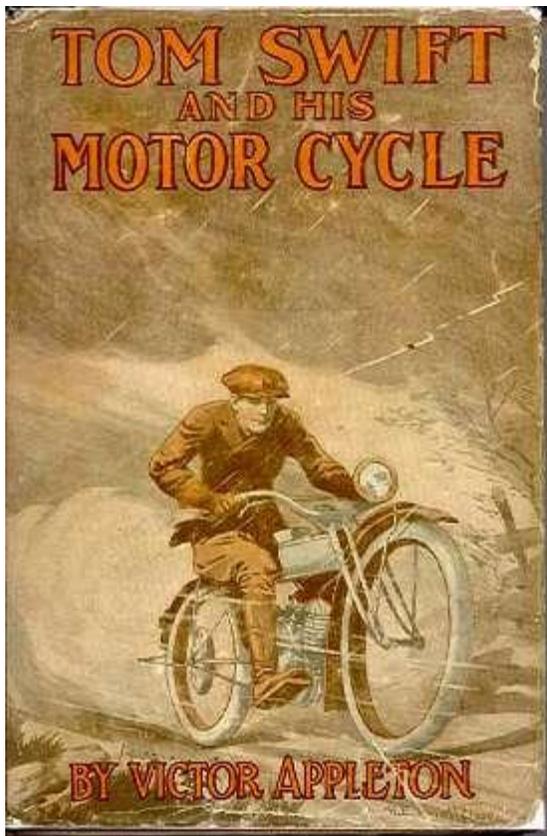
It was later noted, almost as an aside, that Tom had applied for a patent on an improved boat motor propeller, probably to establish his bona-fides as a true inventor like his father, Barton. Tom did demonstrate a consistent ability to diagnose and repair poorly designed or "out-of-order" machinery. He managed to fix Eradicate Sampson's wagon brake, a lawn-mower, and a treadmill powered wood saw. He also repaired a gear-driven butter churn for Mrs. Blackford.

Commentary on Society, Attitudes, Environment & Errata

It's amazing how much society and technology have changed. Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted. It also has helped me to grasp how far and how fast we have come. I wonder what people will be taking for granted 100 years from now. At this reading in 2005, this book is 95 years old. The list price of this volume was \$0.40 postpaid from the publisher.

Attitudes and Prejudices: Society and attitudes are/were very different at the beginning of the 1900's. African-Americans were heavily stereotyped and referred-to in what are now considered "racist" terms. Colored, darky, coon and nigger were all terms used unabashedly to describe persons with other than white skin. These folks also were invariably portrayed as poorly educated and spoke in a deep-south slave-patois.

Women were relegated to the status of ornaments. It was considered "curious" for a female to drive an automobile, or to go unescorted. All but older matronly types (like Mrs. Baggert) were considered flighty and easily frightened. Even Mrs. B. "couldn't stand the sight of blood," and spent quite some time screaming "murder" during a burglary, late in the story.



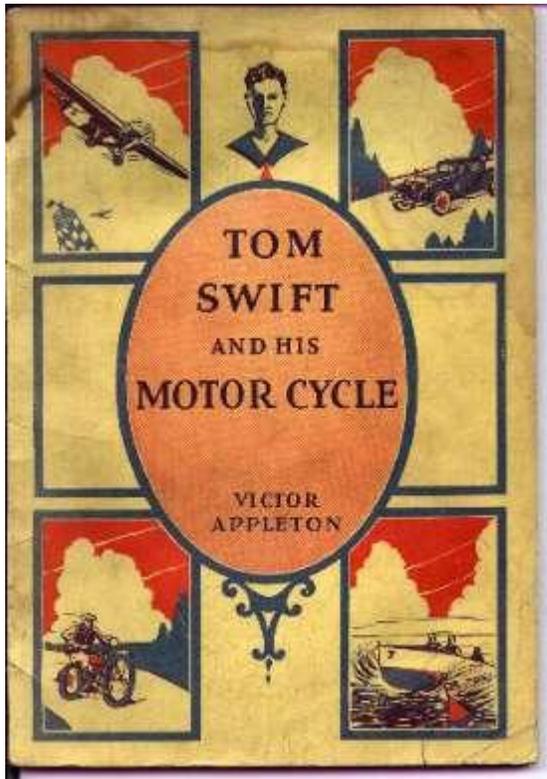
Tramps and/or hobos roamed the countryside, cadging meals, begging for money or stealing. Inevitably, they were portrayed as uneducated, and most seemed to speak a form of "thug-ese," which involved poor grammar and the use of "youse" when referring to others. Being "jugged" meant a night in jail, and "peaching" meant informing on your friends. (We'd use "rat" or "snitch" or "drop a dime," today.) Bad-guys invariably wore facial hair, usually of the bushy-beard variety. Throughout this series, beard=bad guy.

Lots of old-school common sense was dispensed with one-liners (aphorisms,) such as "nothing good comes quickly," and "one thing at a time."

Police were ineffective, and were mainly useful for "looking wise" and snooping around. Vigilante-type justice was the order of the day, with impromptu posses taking capturing criminals into their own hands. It was apparently common to go armed, with Tom carrying a revolver on his road trip. A burglar at the Swift residence was met with a "small, but effective" repeating rifle. This was apparently black-powder, as it made enough smoke when discharged, that the crook got away in the haze.

Theft, as long as it was from criminals, was apparently OK. Tom appropriates a motor-boat that the crooks used to cross *Lake Carlopa*, but later turns it in to the authorities. Tom also invites himself in to a church horse barn for shelter from a storm and later makes himself breakfast at a shack while the owner is away. (He does leave money behind to pay for the food that he consumed--but it's unlikely he washed the dirty dishes...)

Taking a stranger in for the night was not unusual or a cause for concern in those days. Rendering aid to those in distress was commonplace and expected. Litigation, while practiced, was frowned upon except in some business matters, and apparently liability lawsuits were unheard of. Simpler, less complicated times...



Speculation As To Author's Identity: The running gag about Mr. Damon's home town (it keeps flip-flopping between *Waterford* and *Waterfield* during the series) has not yet begun. It has been concluded elsewhere that the 1st five volumes of this series were all written *in toto* by Edward Stratemeyer, their creator. James Keeline states that specific documentation exists tying the first two volumes of this series firmly to Howard Garis, a ghost writer who is said by some to have penned most of these tales. Many later volumes were sub-contracted to a whole series of ghost writers, who were contractually unable to communicate with one another. Writing styles varied enough that no *one* author (such as Garis) could have penned them *all*. It is interesting to note that if Mr. Stratemeyer did write all of the 1st five, even *he* couldn't keep the details straight. In Volume 1, 2 & 5, Mr. D's home is *Waterfield*. In Volume 3, *Waterford* is "it" and in Volume 4, *no* home town is specified. Frankly, the writing style in #4 is enough different, that I'd hesitate to put any money on a bet that Ed Stratemeyer did anything but outline these stories or possibly only review the finished product.

In spite of these inconsistencies, this particular tome has the right "feel" to have come from the pen of *The Master*. Perhaps *The Master* really was Garis, not Stratemeyer.

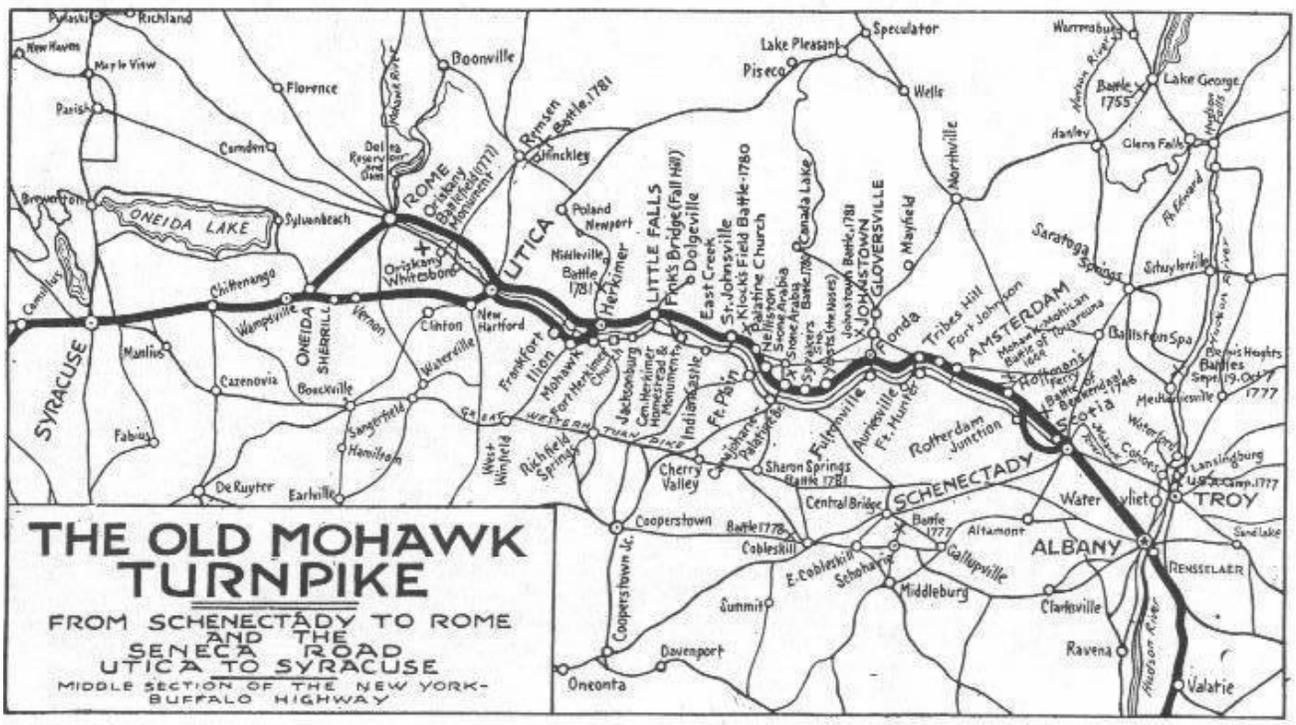
Errata: The few that were noticed were limited. Tom's deceased mother was named as Mrs. Barton, on p.9. During Tom's trip, Centreford and Pompville get reversed between pages 87 and 103. On p.128, the Blackford farm family was up and about at 10PM. Anyone who has ever worked a farm, knows that "early to bed, early to rise" is the order of the day, if you expect to get the chores done. Milk cows don't wait. 10PM would truly be the wee hours for a farm family if you are up at 4:00AM.

Geography: The 'look and feel' of upstate New York was authentic as described. Rolling hills and dense woods are common, even today. Many lakes dot the landscape, and several are far enough north and big enough to match a landmark like the fictional *Lake Carlopa*.

The only recognizable NY landmarks used in the story are *Dunkirk* (in reality, on the shore of *Lake Erie*) and *Albany* on the other (eastern) side of the state. These landmarks are separated by a distance of 285 miles as the crow flies. Much more so, by even modern roads. *Shopton* is described as a "village" on the east shore of *Carlopa*. Later, it is also said to be located on a river. The nearest "town" of any size is *Mansburg*

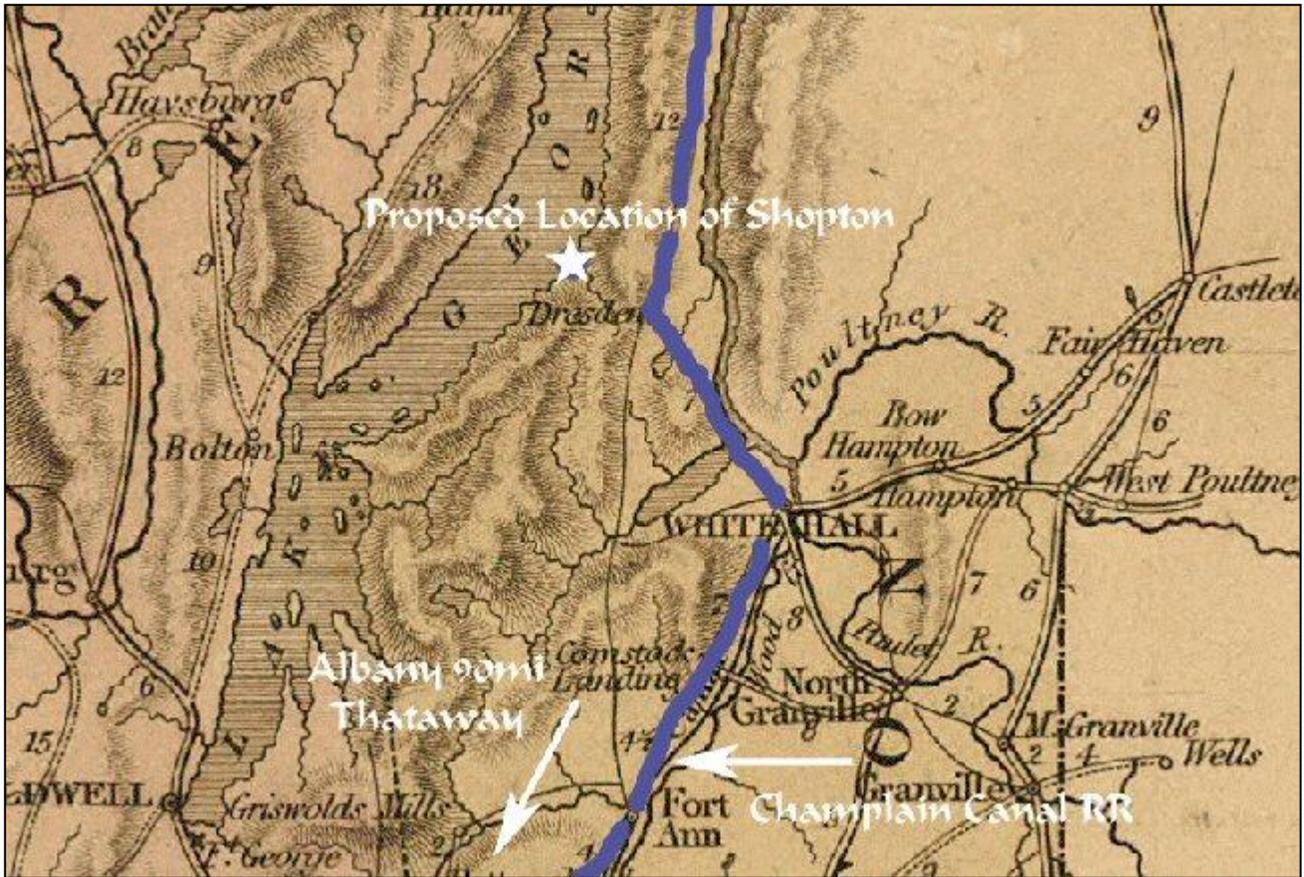
(home to Mary Nestor.) Tom's home is described as being on an unpaved "country lane" and backs up to the wooded shore of *Lake Carlopa*. Shopton is described as being "one day's ride" via motor-cycle (about 100 miles on unpaved roads) from *Albany*, and is apparently located along a major railroad line.

Only a "turnpike" that Tom travels, is described as being paved with Macadam.



One possibility for a location of *Shopton* could put it near the mid-line of the state, possibly on the shore of *Lake Oneida*. *Oneida* is near "the" Turnpike in that area, the *Old Mohawk*. (See Illustration, above) It would also be near at least one major RR line. Several lines follow the Mohawk River Valley & Erie Canal. *L. Oneida*, however, does not have the "numerous islands and bays" that play pivotal roles in later stories, and is much wider in its east/west dimension than it is north/south. Plot locations indicate a narrow east/west topography, easily crossed by a small open boat. *Oneida* seems too large for this, and does not have the requisite wooded hills on both shores.

The other possibility (and my favorite) is *Lake George*. It is some 90 miles north of *Albany* at its midpoint. It has the right shape and topography, but the only railroad connections in the early 1900's were not 'major.' One such line does sort of run up the east shore of the lake, and has a waypoint in the town of *Dresden*. *Whitehall*, NY is the nearest population center of any size, and could be the model for the fictional town of *Mansburg*. No listed "turnpikes" were found in the area. That area was pretty wild & wooly in the early 1900's. In spite of this, it's my best guess as a location for Tom's adventures.



Northeastern New York State ca. 1900

Waypoints on the trip to *Albany* are *Centreford*, *Pompsville*, *Edgefield*, and *Fordham*. In the story, *Dunkirk* is about "70 miles from *Centreford*." (*Dunkirk* would be in the opposite direction from the route between either proposed *Shopton* location, above, and *Albany*.) Other population centers are *Meadton*, and *Pineford*, as well as *Mansville* and *Reedville*. *Waterfield* (sometimes home of Mr. Damon) is not given a direction, but is close enough for a casual ride via horse, bike or auto and could be modeled on *Dresden*, although, later Damon's home is stated to also be on *Carlopa's* shoreline.

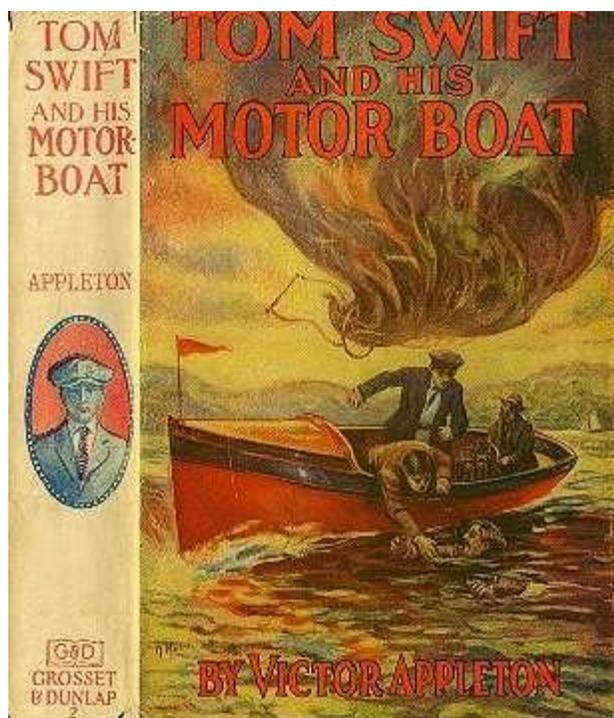
JP Karenko 3/28/05 rev 2. 8/31/2006

#2. Tom Swift and His Motor-Boat (1910)

Or, The Rivals of Lake Carlopa

Review by JP Karenko, March 2005, Updated September 2006

White Quad Dustjacket from the collection of Mark Snyder



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

The book opens with Tom getting ready to attend an auction. The boat used by the criminals who stole it in Volume #1 has been damaged. The owner wants rid of it, as he has purchased a larger, more powerful craft as a replacement. Tom gets in a bidding war with one Andy Foger, a red-haired squinty-eyed bully, who likes machinery that goes fast, and edges him out by only a few dollars. A "mysterious stranger" takes an inordinate interest in the boat, and is run off after apparently trying to damage it. Later, on the trip home, Tom encounters Andy Foger, who has laid an ambush for Tom by dragging a log across the road to cause an accident. Tom is warned of the obstruction by Eradicate Sampson, an itinerant Negro handyman, and in the ensuing melee, Tom "thrashes" Andy.

Tom gets his new boat home, and begins an overhaul and modifications. The boat seems to attract trouble with repeated attempts by persons unknown to tamper with, damage and finally, to steal the craft. An electric gyroscope, developed by Tom's father Barton, is another anchor around which the rest of the story revolves. This device and some valuable tools are also stolen, causing Mr. Swift, whose health is failing due to age and overwork, much concern.

It is determined that the criminals that are causing all the mayhem are the Happy Harry Gang, a bunch of bad guys introduced in Volume #1 of the series. They seem to have several parallel agendas, which confuse things for Our Heroes. The Swifts industrial secrets are at risk, the boat-which is valued at about \$900 new, and a mysterious "sparkler" are all objects of desire and mysterious criminal intent.

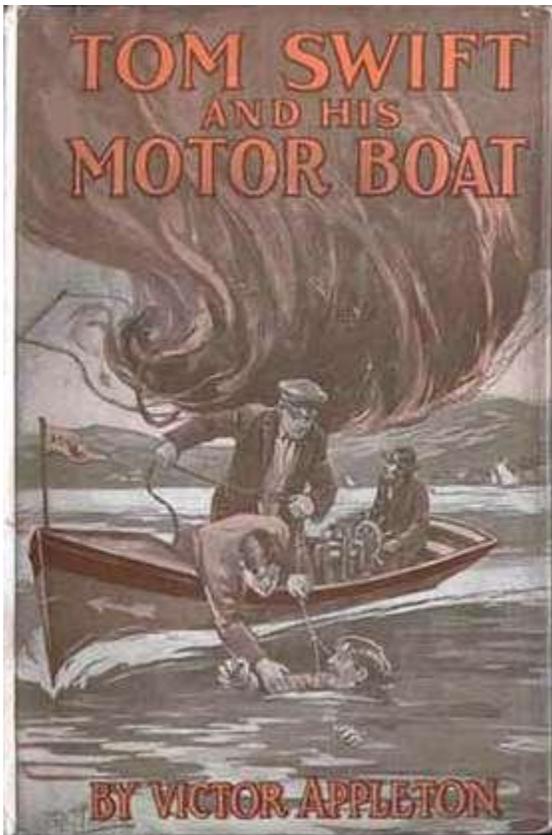
Tom seems to always be in the right place at the right time to rescue people. He saves Mary Nestor (who is now considered a "friend") when her boat motor "goes back" on her out on *Lake Carlopa*, Mr. Damon's automobile is repaired when it malfunctions, Mr. Duncan is kept from bleeding to death after a hunting accident, and an "aeronaut," one John Sharp, is saved from a burning hot-air balloon that crashes into the lake.

The bad guys are caught and jailed, but slip away from police after a jailbreak in the "confusion of a summer storm," undoubtedly to return at a later date...

Cast of Characters (More or less in order of appearance)

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical.

Barton Swift--Widower. Wealthy but conservative and not flashy or pretentious. Inventor master machinist and holder of numerous patents. In this episode, described as "aged" and "working too hard."



Mrs. Baggert--Housekeeper. Kindly, and like a 2nd mother to Tom. Employed by the Swift family for 10+ years at the time of this story. Willing to feed and house strange visitors that Tom and his Dad seem to attract, without complaint.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. While previously trying to control his new motor-cycle, he was injured when the machine tried to "climb a tree." In this tome, he "resides in nearby Waterfield," and suffers from liver ailments. Self-described as "too stout to walk," and "cannot run." In spite of this, he is also described as "nimble for his size." Apparently quite wealthy, he has graduated from cycles to automobiles. He has serious engine trouble, which Tom repairs, handily.

Andy Foger--Red haired, squinty-eyed bully, who makes great trouble for Tom. "Poor little rich kid," son of wealthy family, born with a chip on his shoulder. Reckless, blustery and angry. Showoff. "Has money, and not much else." Lately has acquired a racing motor-boat.

Sam Snedecker--Cohort of Andy Foger. Voice of reason to Andy's scream of rage. No description given.

Ned Newton--Chum & companion of Tom, currently employed in a Shopton bank. In this episode, we find out Ned is an avid photographer and also loves boating & camping.

Tod Boreck, A.K.A. "Murdock"--The Well-Dressed stranger in a white straw hat. Thief. Dishonorable, even toward his criminal buddies.

Mr. Jacob Wood--Auctioneer who sells Tom the motor-boat.

Mr. Hastings--NFN or description given. Previous owner of the BIQ (Boat-In-Question.) Has upgraded to a larger, faster, 4-cylinder model. He is disposing of the *Carlopa/Arrow*, as it was damaged when stolen.

The "Happy Harry" Gang--Now named as such. These guys show up singly and in groups throughout the story.

Jake Burke, A.K.A. **"Happy Harry"**--Ringleader & brains of the outfit. Educated, and plays the part of a tramp, poorly. Tattoo of a ring on the small finger of his left hand. Constantly trying to steal Barton Swift's patent models and plans.

Anson Morse--Snappy dresser who on occasion wears kid (leather) gloves. Black moustache. Uses a false beard while playing the part of a bum. Sneak-thief who steals papers from Swift property. Apparently also well-educated.

Wilson Featherston, A.K.A. **"Simpson"**--Thug / muscle for the gang. Knows knockout techniques and drugs. Acts as chauffeur/driver for gang.

Ferguson Appleson--Thug / muscle for gang.

Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. **Rad**--Aged stereotypical Negro journeyman jack-of-all-trades. Chicken-coop cleaner and whitewasher. "Eradicates dirt." Also makes a living mowing grass, and sawing wood. Gives the appearance of being lazy, but is actually a hard worker and entrepreneur/wheeler-dealer. Heavy deep-south accent and Uncle Remus attitude. Caretaker of mule **Boomerang**.

Garrett Jackson--Aged "engineer" who runs and maintains the steam plant and engine(s) used to power the Swift's belt-driven machine tools. Lives in a shack on the Swift property. Acts as a watchman and handyman around the Swift estate.

Miss Mary Nestor & Friends--Rescued by Tom when her boat, the *Dot*, malfunctions. Described as a "fair young woman with flashing brown eyes." Blushes easily, especially around Tom. Resides in Mansburg, with her father & mother. Greets Tom at a church picnic, and he meets her parents. Later is called Tom's "friend."

Jennie Haddon--Has an eye for Tom. Enjoys having Tom "explain things mechanical" to her. No description.

Miss Carson--NFN given. Passing mention. No description.

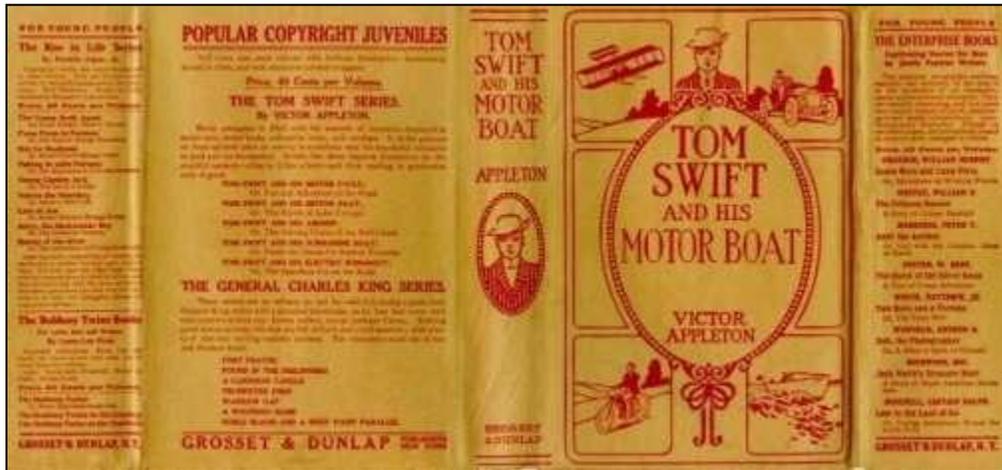
Theodore Duncan--Hunter who in this episode shoots himself accidentally and is saved from bleeding to death by Tom.

Dick Blythe--No description. Owns the boat *Dot* and a cottage on *Lake Carlopa*. "Sort of a 2nd cousin" to Mary Nestor.

Pete Bailey--Cohort of Andy Foger Passing mention.

Mrs. Foger--NFN given. Kindly, genteel, polite and gracious. Everything her son, Andy is not. Clueless as to Andy's true demeanor. Thinks he is just "troubled."

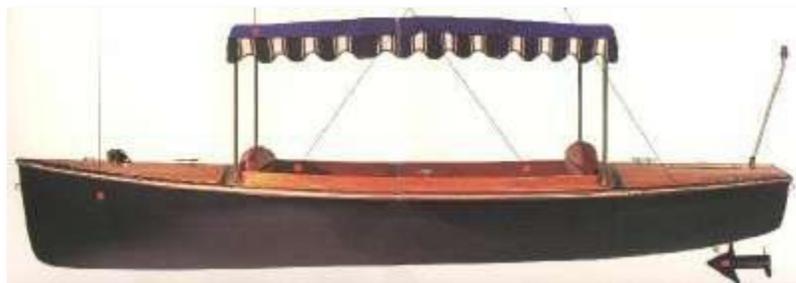
John Sharp--Professional balloonist and trapeze artist. Wears tights with spangles, and speaks in short terse sentences. Rescued by Tom when his hot-air balloon gets a bit *too* hot and burns. Deputy Sheriff as a sideline. Co-designer with Tom, of an Aeroplane Dirigible Airship, to be introduced in book #3.



(Very rare brown quad dustjacket, courtesy of James Keeline; found on very early editions)

Major Inventions

Once again, Tom Swift didn't really "invent" anything in this book. He did do significant engineering development work on a damaged boat that was purchased at auction. His modifications included changing the ignition system & plugs, the water pump, adding a pressure oiling system and installing a weather canopy with side curtains. These changes, along with a stronger fuel tank mounting, improved the performance of the machine, increasing the top speed enough to keep up with a 3-cylinder racing boat of the "automobile launch" variety. Auto launches had the motor forward, under a Model A style "batwing" hood arrangement. Tom's boat was a 21ft-12-seater "family cruiser" with a 10hp, 2-cylinder, 2-cycle motor able to go 10mph at top speed, before Tom's modifications. The motor was amidships, and presumably exposed as Tom was constantly tinkering with it to maximize the performance.



1910 era "Family Cruiser"

These boats had manual adjustment "gasolene" and sparking levers. Performance was maximized "by ear," as no instruments of any kind were mentioned in the story. Ignition was provided by either magneto or dry cell (presumably used with an automobile-type "spark coil.") Ignition and fuel systems were quite unreliable, and required constant tinkering.

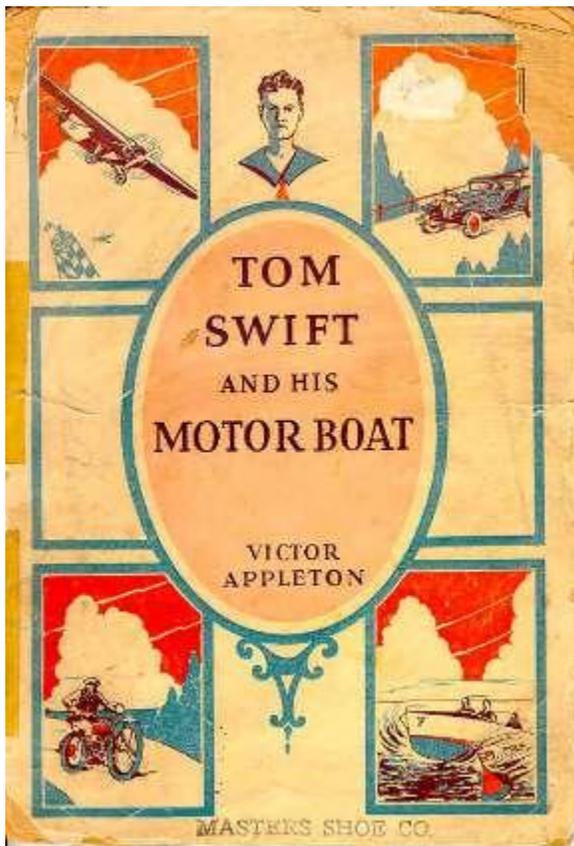
The main invention in this story was once again made by Tom's dad. It was an electric powered gyroscope to be used for "making aeroplanes more stable in wind."

Barton, always the opportunist around machinery, also had ideas for a new "kitchen boiler," which is surmised to be either a water heater or maybe a dishwashing machine.

Late in the story, Tom and John Sharp collaborate on the design of a dirigible/aeroplane airship, to be chronicled in the next volume of the series.

Commentary on Society, Attitudes, Environment & Errata

It's amazing how much society and technology have changed. At this reading in 2005, this book is 95 years old. The list price of this volume was \$0.40 postpaid from the publisher.



Attitudes and Prejudices: Society and attitudes are/were very different at the beginning of the 1900's. African-Americans were heavily stereotyped and were invariably portrayed as poorly educated and speaking a deep-south slave-patois. At least in this volume, denigrating terms were not noted when reference was made to other than white skinned people. Other tales in the series will not be so considerate to persons of color.

Women were relegated to the status of ornaments. It was considered "curious" for a female to drive an automobile, or to go unescorted, especially after dark. "Girls don't know much about machinery." As a whole, Mary Nestor is un-stereotypical, being willing to take the risk of operating a small motor-boat without male assistance. She does, however require rescue and blushes prettily when around Our Hero. Machinery was unreliable, and when it went wrong, it was described as "going back." Automobiles had to be "cranked up" by hand, either from the front or side. Shoes had buttons.

Language usage was quaint. The author has discovered the word "clew" (British spelling) and uses it a lot. However, while the previous volume used the British spelling of *gasolene* for petroleum fuel, in this tale the familiar

American spelling is utilized. Several authors had a hand in writing these stories, and they were never definitively identified. I feel that language usage and societal attitudes will play a major part in at least grouping the stories by any given ghost writer together. I speculate further, below.

"Hoodoo" was an unseen miasma like "bad luck" (but not as bad as a curse.) When present, it made things go wrong. Most bad-guys seemed to speak a form of "thug-ese," which involved poor grammar and the use of "youse" when referring to others. "Trimming" meant cheating your criminal friends. (We'd use "skim" today.) Bad-guys invariably wore facial hair, usually of the bushy-beard variety. Throughout this series, bushy beard=bad guy.

Lots of old-school common sense was dispensed with one-liners, such as "Speculation is idleness," "Worry is bad for digestion" and "One thing at a time."

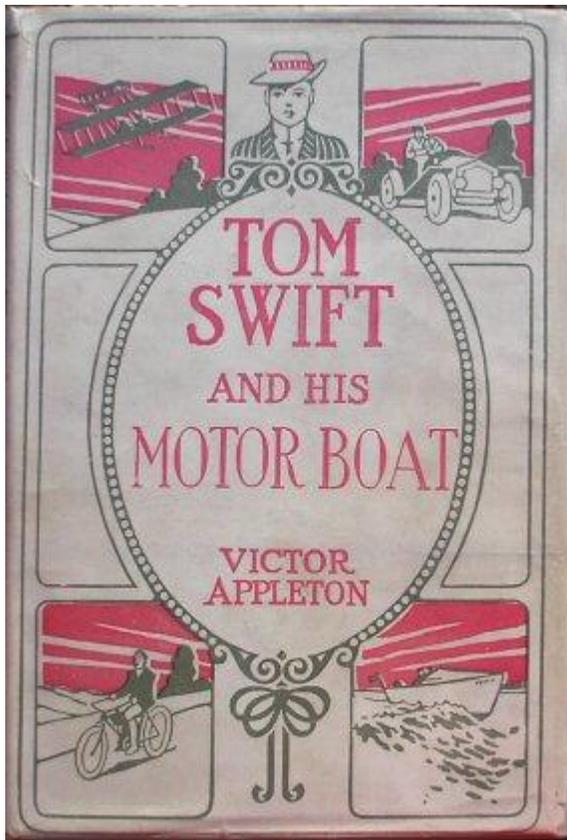
Police were ineffective, and were mainly useful for "looking wise." They would promise to "do all they can," which was described as "not much." Captured crooks escaped jail due to "confusion during a storm." Vigilante-type justice was the order of the day, with citizens taking capturing criminals and settling scores into their own hands without fear of litigation. It was apparently common to go armed. Tom kept a shotgun in his boat and another at his home, but "only to intimidate, not to shoot" bad guys. When dealing with Andy, Tom was described as being "able to do as well as the police" when evening the score. This was done with bare knuckles-"thrashing" was adequate redress back then, for wrongs that would end up in court, today.

Taking in a stranger as a houseguest for a night or even several weeks, was apparently not unusual or a cause for concern in those days. Rendering aid to those in distress was commonplace and expected. An injured aeronaut is treated by the Swifts' personal physician, apparently without cost. Doctors made house calls in those days. Interestingly, the author(s) in this series treated *all* medical men with disdain, almost never giving them even the courtesy of a physical description or first names. Even when named, only rarely in the series is the same doctor called upon to perform a service more than once. Tom's first-aid skill making a tourniquet saved Mr. Duncan from bleeding to death, but burn treatment has changed, dramatically. Putting oil or Vaseline on burns, as they did in the story, would make a modern doctor recoil in horror. Good Samaritans ruled in Tom Swift's world.

Speculation As To Author's Identity: The running gag about Mr. Damon's home town (it keeps flip-flopping between *Waterford* and *Waterfield* during the series) has not yet begun. It has been concluded elsewhere that the 1st five volumes of this series were all written *in toto* by Edward Stratemeyer, their creator. James Keeline states that specific documentation exists tying the first two volumes of this series firmly to Howard Garis, a ghost writer who is said by some to have penned most of these tales. Many later volumes were sub-contracted to a whole series of ghost writers, who were contractually unable to communicate with one another. Writing styles varied enough that no *one* author (such as Garis) could have penned them *all*. It is interesting to note that if Mr. Stratemeyer did write all of the 1st five, even *he* couldn't keep the details straight. In Volume 1, 2 & 5, Mr. D's home is *Waterfield*. In Volume 3, *Waterford* is "it" and in Volume 4, *no* home town is specified. Frankly, the writing style in #4 is enough different, that I'd hesitate to put any money on a bet that Ed Stratemeyer did anything but outline these stories or possibly only review the finished product.

In spite of these inconsistencies, this particular tome has the right "feel" to have come from the pen of *The Master*. Perhaps *The Master* really was Garis, not Stratemeyer.

Errata: Errata that were noticed were limited. The Lanton Motor Boat Club on p.176 was first referred to as the Lanton Motor Club on p.59. There was some confusion about "up" and "down," when referring to directions. At least in this hemisphere, most folks refer to anything more northerly than where they are as, "up" there. By the same convention, anything more southerly than where the speaker was is "down" there. Sandport, at the south end of the lake, was several times referred to as "up here" when compared to the rest of Lake Carlopa and Shopton. No mention was made of an altitude change, such as the resort being on a hillside. That part of New York State is quite hilly, being surrounded by the Adirondack Mountains on the west and Vermont's Green Mountains on the east.



Geography: The geography of upstate New York remains authentic and is further described. Woods that overhang the lakeshore are common, and make NY lakes picturesque. The fictional *Lake Carlopa* is further described as "cut up with bays and gulfs," and having the resort town of Sandport at its' south end. It is 5 miles across, implying the long axis runs north/south. The lake is estimated to be about 80-100 miles in length. This is based on the logic that Shopton is about halfway up the east (right-hand from Sandport) shore of the lake. It takes 8 hours to reach by a boat able to do a maximum of 10mph, but not running wide open. It is also stated that it takes at least "several" days to circumnavigate the lake. The most likely real bodies of water in New York State that *Carlopa* could have been modeled from are *Lake Champlain* which is the right size (but has its east shore in Vermont, and north end in Canada) or *Lake George*, which is actually a bit small (35mi long by 2.5mi wide.) *Lake George*, does have the numerous bays and gulfs, the many small islands (pivotal in later stories) and small towns at both ends. (*George* is my main choice.) The finger lakes are also pretty small, and not as "upstate" as *L. George*. *L. Oneida*, the only other sizeable lake in the vicinity, has the wrong proportions and topography.

Mansburg, a sizeable town and current home to Mary Nestor, is south of Shopton. Waterfield, home of Mr. Damon, (at least in this episode) is south of Mansburg, and is close enough for a casual ride via horse, bike or auto.

The town of Lanton is described as being at the north (head) end of the lake. Daleton is about 20 miles north of Sandport on the west shore and is roughly halfway between Sandport and Shopton. A town named Pratonia is described as "15 miles" inland (further west) from Daleton. There is also an unnamed sanatorium on the west shore, north of Daleton where surgical and other ill patients recover their strength. The nearest real sanatorium is located in Glens Falls, about 25mi south of "Sandport," and decidedly not on the lakeshore.

There are no recognizable "real" NY landmarks named in this story, so all of the above is my speculation.

Tom's home is further described as being a "mansion" with a boathouse and an orchard, on an "unpaved country lane." The property is described as an estate, and sports a steam generating plant and engine(s) to power belt-driven machine tools. At least one major "shop" specializing in electrical machinery is also present. Swift Construction Company, *per se*, does not yet exist as an entity.

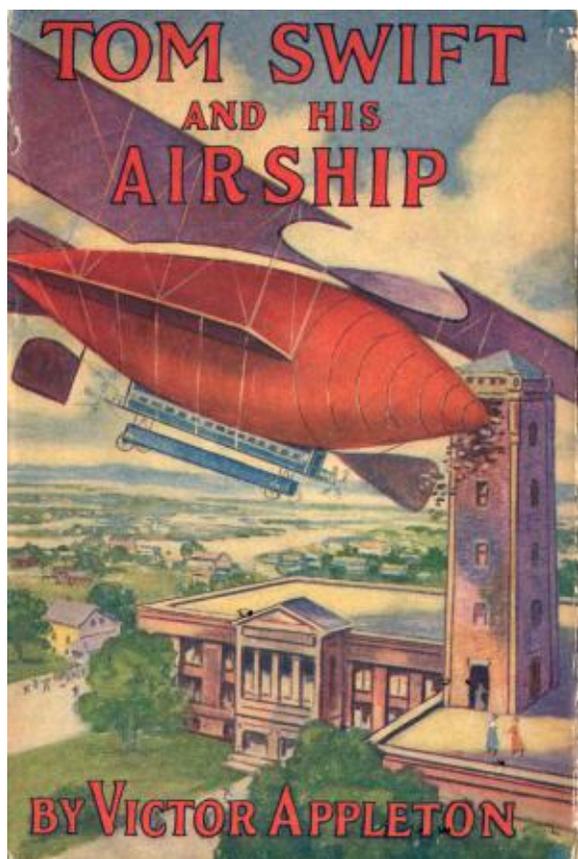
#3. Tom Swift and his Airship (1910)

Or, the Stirring Cruise of the Red Cloud

Review by JP Karenko, April 2005. Updated February 2007

Full-color image from the collection of James D. Keeline

White and Brown Quad images from the collection of Mark Snyder



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

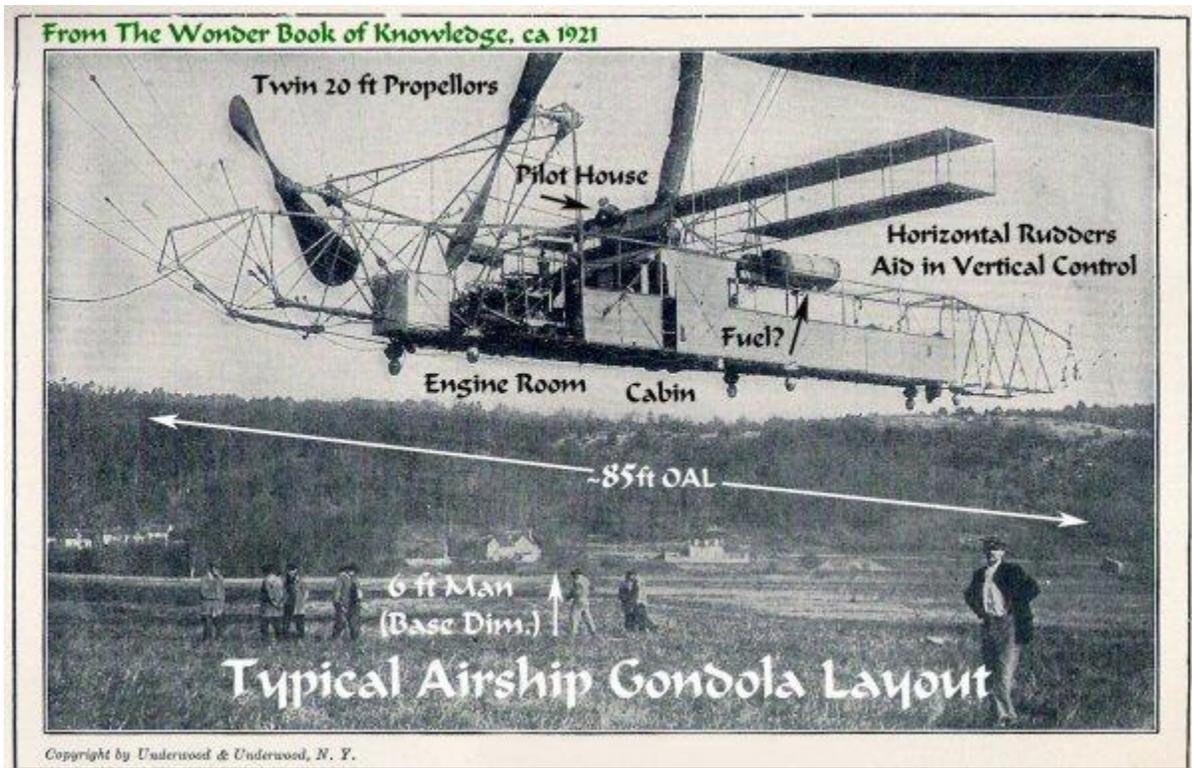
The book opens with a bang, or perhaps, more of a *boom*. Tom and his new friend, balloonist John Sharp, are expelled from their workshop by the explosion of a new volatile lifting gas that Tom has developed for an airship project. *The Red Cloud*, a luxurious combination dirigible/aeroplane is being built for comfortable long-distance travel.

The craft turns out to be quite speedy for its size and Tom wins a silver cup in an air race.

Happy Harry & Gang show up again and quite predictably, burgle the Shopton Bank.

Due to a red herring laid by red-haired Andy Foger, Tom & Mr. Damon are accused of the robbery. They go haring cross-country in their red ship on a test trip, not realizing that the law is red-hot on their tails, due to the tales Andy told. (Sorry, I couldn't resist the urge. It won't happen, again....I hope.)

The trip entails many adventures, and it is not until *The Red Cloud* alights in a small South Carolina village that Tom learns that they are wanted fugitives. He had suspected as much, earlier, when they were shot-at by police as they flew over another town. They turn for home and as incredible good luck would have it, cross paths with the bad-guys. You'll have to read the book to know the ending.



Cast of Characters (More or less in order of appearance)

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. Is a decent cook, too.

John Sharp--Professional balloonist and trapeze artist. Among other bad habits, has been known to wear tights with spangles. He is rescued by Tom when his hot-air balloon gets a bit *too* hot and burns. Deputy Sheriff as a sideline. Co-designer with Tom, of the Airship, *Red Cloud*. Is 'dark of complexion' and speaks in short, choppy sentences.

Barton Swift--Widower. Wealthy and conservative. Not flashy or pretentious. Inventor master machinist and holder of numerous patents. In this episode, described as "aged," "nervous," "distracted" and sometimes "oblivious to his surroundings."

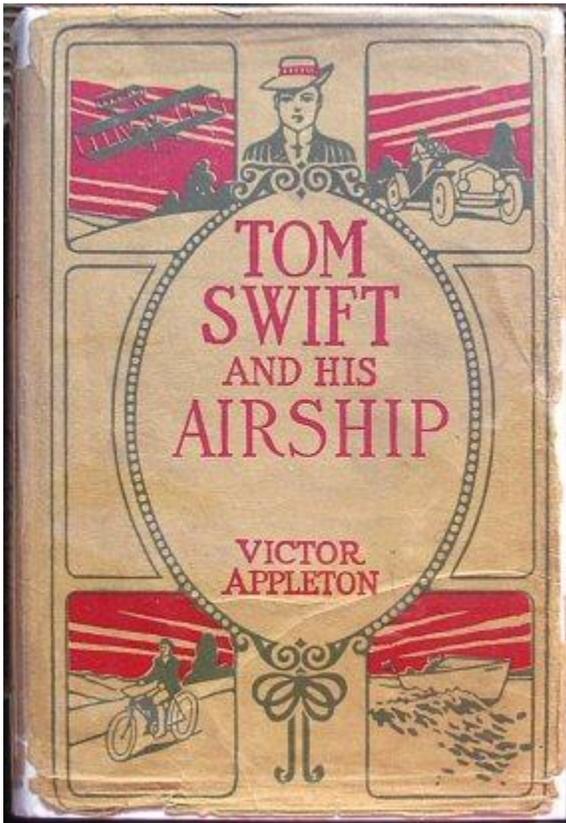
Mrs. Baggert--Housekeeper. Kindly, and "loves Tom like a son." Employed by the Swift family for 10+ years at the time of this story. She is short of stature and has to stand on a soap box to kiss Tom goodbye on one of his voyages.

Andy Foger--Red haired, squinty-eyed bully, who makes great trouble for Tom. "Poor little rich kid," son of wealthy family, born with a chip on his shoulder. Reckless, blustery and angry. Showoff. "Has money, and not much else." Lately has upped the ante to doing sabotage against Tom's Airship.

Sam Snedecker--Cohort of Andy Foger. Voice of reason to Andy's scream of rage. No description given.

Pete Bailey--Cohort and willing minion of Andy Foger. No description given.

Garrett Jackson--Aged (65+ years old) "engineer" who runs and maintains the steam plant and engine(s) used to power the Swift's belt-driven machine tools. Lives in a shack on the Swift property. Acts as a watchman and handyman around the Swift Estate.



Ned Newton--Chum & companion of Tom, currently employed in Shopton National Bank. Ned needs Mr. Swift's intervention to get time off to go adventuring with Tom.

Mr. Merton--NFN given. Proprietor of Merton's Machine Shop, a supplier of aluminum bolts to the Swifts. Passing mention, he does not appear.

Anson Morse--Snappy dresser who on occasion wears "kid" (leather) gloves. Member of Happy Harry Gang (See below.) Black moustache. Uses a false beard while playing the part of a bum. Sneak-thief who has stolen papers & tools from Swift property. Apparently well-educated.

Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro journeyman jack-of-all-trades. Chicken-coop cleaner and whitewasher. "Eradicates dirt." Also makes a living mowing grass, and sawing wood. Gives the appearance of being lazy, but is actually a hard worker and entrepreneur/wheeler-dealer. Heavy deep-south accent and Uncle Remus attitude. Caretaker of mule **Boomerang**. In this tome, he attacks Anson Morse with a broom and dumps whitewash on him.

Miss Perkman--NFN given. Principal of Rocksmond Young Ladies' Seminary. Astrigent, bristling & bespectacled old-maid

type. Seriously up-tight attitude.

Miss Mary Nestor--Described as a "young woman with flashing brown eyes and fair of face." Blushes easily, especially around Tom. Resides in Mansburg, with her father & mother. Meets Tom in this volume, at her school, the Rocksmond Young Ladies' Seminary. Now considered "very friendly" toward Tom.

Miss Delafield--NFN given. Teacher at Rocksmond Seminary, Young & pretty, but with a serious "know-it-all" attitude. Her B.S. degree is of the barnyard rather than academic type.

The Fussy Frenchman--Aeronaut, who pilots a small, speedy monoplane. Annoying manner, short stature and large ego. Challenges Tom to an air race. Loses poorly.

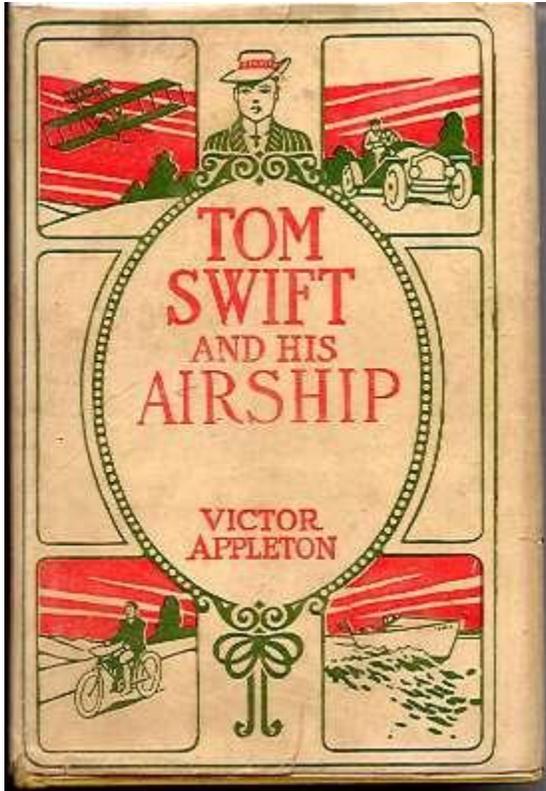
Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. In this tome, he "resides in nearby Waterford," (see errata) and suffers from liver ailments. Self-described as "too stout to walk," and "cannot run." In spite of this, he is also described as "nimble for his size." Apparently quite wealthy, he has graduated from cycles to automobiles, but has ongoing trouble controlling any conveyance he tries to control. So far, has crashed a horse, a motor-cycle, and lately, an automobile. His experience with airship(s) is as yet, un-chronicled.

Mr. Harrison--NFN given. Shopton hardware dealer who sells tools to John Sharp. Passing mention, only.

Chief Simonson--NFN given. Chief of Shopton Police. Able to leap to false conclusions at a single bound...

Con. Higby--NFN given. Shopton Constable. Star student of Simonson in conclusion-leaping department.

Isaac Pendergast--President of Shopton National Bank, Pompous & blustery. Ned Newton's boss.



The "Happy Harry" Gang--Now named as such. These guys show up singly and in groups throughout the story.

Jake Burke, A.K.A. "Happy Harry"--Ringleader & brains of the outfit. Educated, and plays the part of a tramp, poorly. Tattoo of a ring on the small finger of his left hand. In this story, graduates from industrial espionage to bank robbery.

Anson Morse--See above.

Wilson Featherston, A.K.A. "Simpson"--Thug / muscle for gang. Knows knockout techniques and drugs. Acts as chauffeur/driver for gang.

The Pretty Young Waitress--Resident of Berneau, SC, but only long enough to hook up with someone like Tom. Pretty, but no real name or other description is given.

The Grocer--Merchant in Berneau who sells provisions to who he thinks are "automobilists." No name or description is given.

Sheriff Durkin of Shagmon--NFN given. Proof that not all LEO's in these stories are useless. Helps Tom capture Morse & Burke. Never ridden in either an automobile or an airship before meeting

Our Hero. No first name or description is given.

Mr. Foger--NFN given. Bank board member. Champion Conclusion Jumper. Role model for nasty son, Andy.

Major Inventions

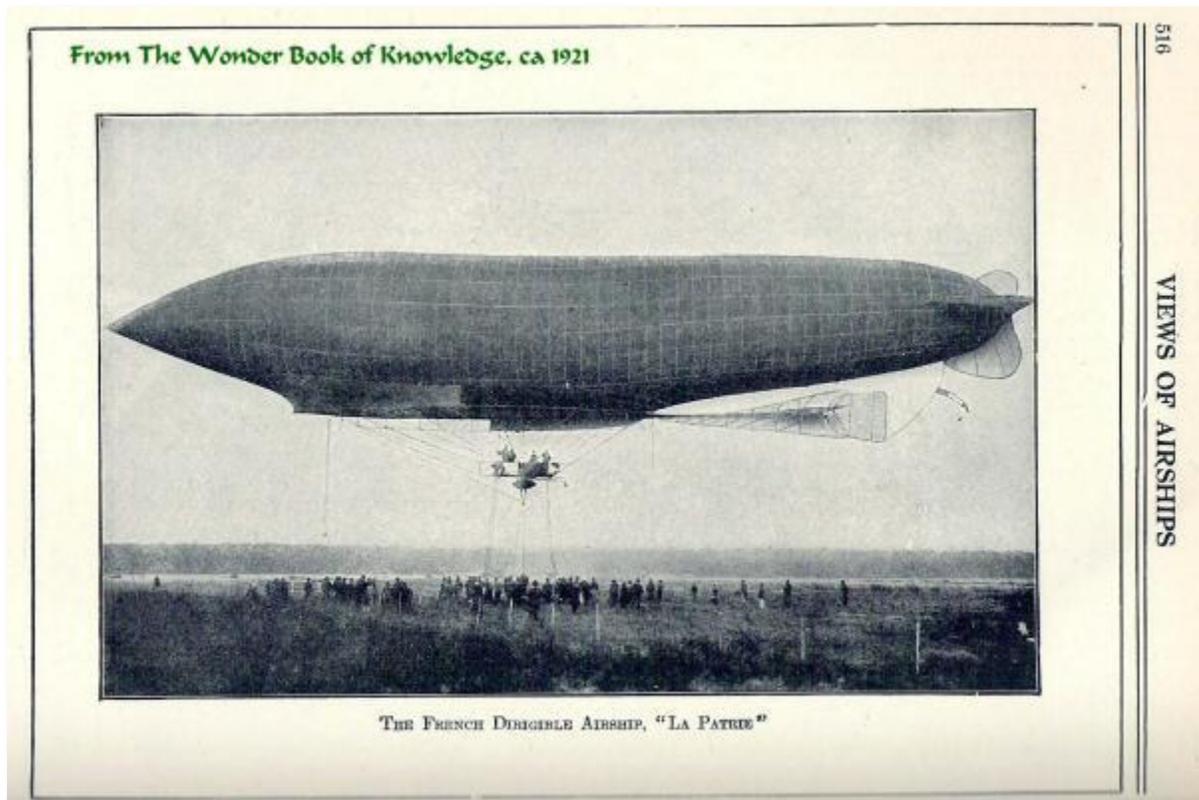
Tom Swift was a co-inventor (with John Sharp) of a combination aeroplane-dirigible in this book. He machine has conventional biplane wings and twin control rudders for extended aeroplane flight. A rigid, flat top, multi-cell "gas bag" made from aluminum and painted red, can be used to provide VTOL and buoyancy "when speed is not needed." The aircraft is powered by a 20-cylinder air-cooled engine running at 1500 rpm, invented by Tom's father. The motor drives two 8-foot diameter airscrews, laminated from wood and operated in a push-pull configuration. Top speed is listed as 80mph in a moderate wind. With only one propeller operating, speed is 50mph. Sustained cruise speed is listed as 30mph. The gas generator has sufficient capacity to sustain lift for up to two weeks. No external dimensions are given, except to intimate the craft is "large." In reality, it would have to be Hindenburg-sized to lift all the luxurious accoutrements Tom adds. More on this topic, later.

Accommodations include an observation car, forward, equipped with pilot gear, floor-mounted windows and easy chairs. There is enough room to sleep 5. There is a galley, with electric stove/space heater, and provisions for one week. An equipment room, with the engine and gas generating equipment is aft. Forward and rear observation platforms under the propellers allow for a less obstructed view and room to take some fresh air.

A rubber-tyred <sic> undercarriage for takeoff and landing is mounted below the cabin.

There are several intriguing scientific concepts here, one being the process of making "a powerful gas, partly Hydrogen" that has lifting power, greater than H₂ alone. Containing it under pressure, in a rigid aluminum box sounds risky. This highly explosive gas seems to generate more lift as pressure is increased, and the chemical reactions that create it, slow down when the temperature is increased. (See errata.)

As almost an aside, Barton Swift is working on a "submarine device" that will revolutionize undersea travel. No details were given, except an admonishment to read the next book in the series.

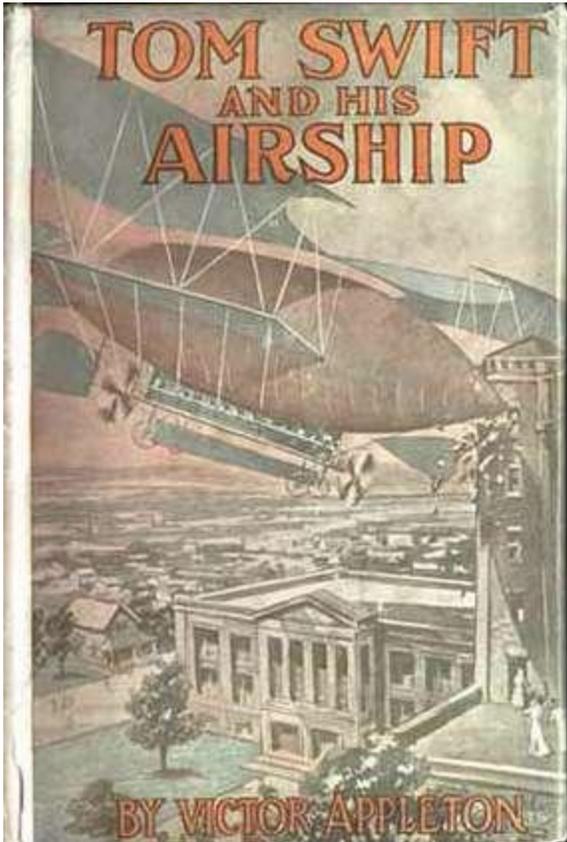


Commentary on Society, Attitudes, Environment & Errata

It's amazing how much society and technology have changed in 95 years. Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted. It also has helped me to grasp how far and how fast we have come. It also gives me an appreciation as to

how much society has changed. I wonder what people will be taking for granted 100 years from now, and what they will think of our times?

Attitudes and Prejudices: Racing for money is bad, but winning silver trophy prizes is OK. Assaulting trespassers is OK. Thrashing and splashing with paint are acceptable treatment. Thrashings (fistfights) are adequate redress for "getting even." Breaking and entering a commercial building is OK, if your motives are honorable, such as spying on criminals. New Yorkers "are desperate bent on reading the



news," according to one Southerner. A letter with money for postage may be safely left for anyone to find with the expectation that it will be taken to the Post Office and mailed, rather than stolen. Accusing someone of grand theft means it is OK to declare open season on them and shoot them on sight. (As is true nowadays--at least in Divorce Court--a good accusation is worth a thousand words of defense.) No proofs are necessary. There is mention for the first time of court litigation for slander and damage to reputation. Eradicate attacks Anson Morse with a broom and a bucket of whitewash, to save Tom from being assaulted. Even north of the Mason-Dixon Line, in that day, I suspect Rad would have been at risk of his very life for attacking a white man, regardless of his honorable motive. Police are still ineffective, and criminals and vagabonds roam the streets in broad daylight with impunity. Vigilante justice still rules, where capturing bad-guys is concerned.

Speculation As To Author's Identity: The running gag about Mr. Damon's home town (it keeps flip-flopping between *Waterford* and *Waterfield* during the series) begins in this volume. It has been concluded elsewhere that the first five volumes of this series were all written *in toto* by

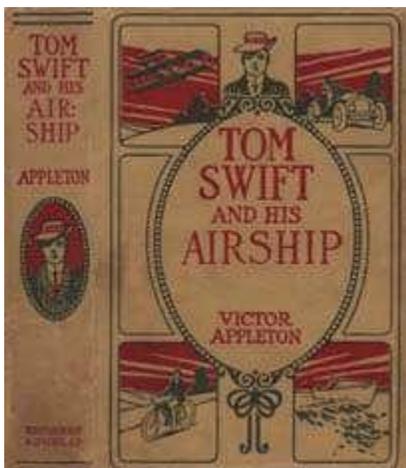
Edward Stratemeyer, their creator. Perhaps *outlined* would be a better descriptor. James Keeline states that specific documentation exists tying the first two volumes of this series firmly to Howard Garis, a ghost writer who is said by some to have penned most of these tales. Many later volumes appear to have been sub-contracted to several other ghost writers, who were contractually unable to communicate with one another. Their writing styles varied enough that no *one* author (such as Garis) could have penned them *all*. This volume, in particular, is a case in point:

This story chronicles a step up in inventive skill levels for "Our Hero." Albeit with the assistance of John Sharp, it involves a major design and construction project, *The Red Cloud*. This is not just a minor modification to a simple device using hardware store components, as in the first two stories. Unfortunately, the science used to describe the operating principles of the device are laughable. (More on that, later.) A major building is constructed on the Swift Estate to house this new device. This "shed" has to be the size of a football field! (What must the neighbors think?) Shopton has grown from a "small village" in the previous tome, to a "small town" and now sports a "national" bank. Eradicate, previously fairly mild-mannered and respectful, (as a proper "person of color" was expected to be in those days,) gets

aggressive, albeit in defense of his employer. He attacks Anson Morse (a known violent criminal) with whitewash, and is said to carry a razor. The overall violence level in the story is up several notches. Tom gets mugged and police come out shooting at the *Red Cloud* willy-nilly in their best *Fearless Fostick* style. For those readers who are under the age of 50, Old FF was a "shoot 'em all and let God sort them out" Pinkerton-style policeman from the *Lil' Abner* cartoon strip. (Since Fearless wasn't introduced until 1942-50, perhaps Al Capp, the strip's artist read TS as a child?) Fearless was especially noted for creating collateral damage amongst innocent bystanders when apprehending criminals and his own ability to recover from multiple gunshot wounds, unscathed. See illustration, below.



The general change in tenor of the environment, the ambitious, but limited "science" skills and the fact that the author could not keep Mr. D's home anchored in one place, lead me to think this writer is not the same one who penned the first two volumes. I'd hesitate to put any money on a bet that Ed Stratemeyer did anything but outline this story or possibly only cursorily review the finished product. I'll tentatively tag the author of this one with the nickname "Airship Art."



Errata: The running gag throughout this series about Mr. Damon's home flip-flopping between *Waterfield* and *Waterford*, NY, now requires a scorecard.

There will ultimately be 4 distinct categories of location. In this tome, Mr. D's home is listed in *Waterford*, NY, for the first time.

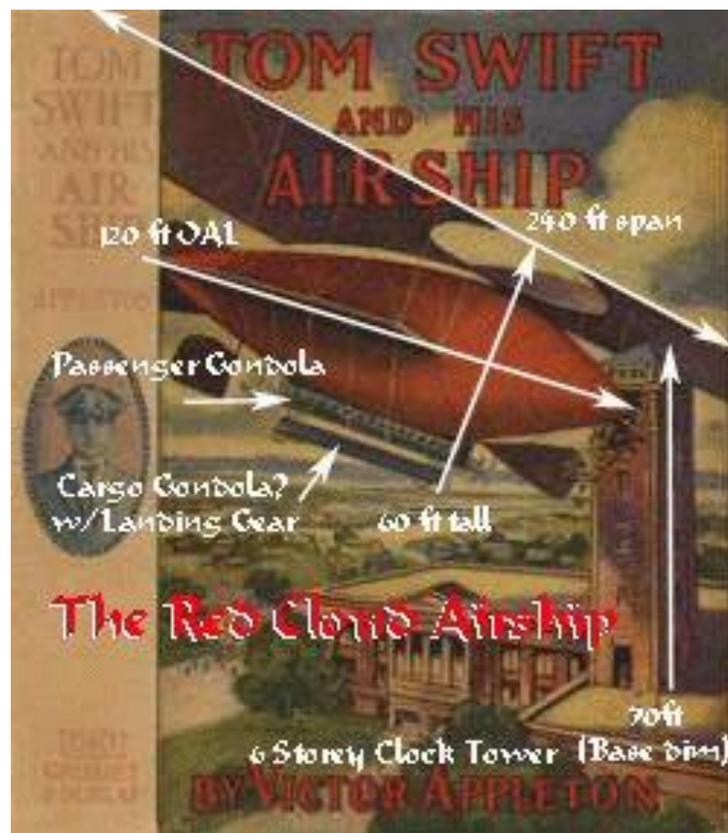
The tally for 3 volumes, to date is:

***Waterfield*-2, Both places-0, *Waterford*-1, and No mention-0.**

Typos that were encountered: "Swift" is not capitalized on p.76, and Rad's mule is called "Boomerange" on p.88, and Tom is "becomming" an expert flier on p.119. On p.189 the "post Office" is referenced.

Actually, this level of proofreading skill is pretty decent for the series.

Engineering and Science, Fact vs. Fantasy: In this volume, it is apparent that the limits of the engineering and scientific knowledge of the author(s) has been reached. Tom employs his own patented "device to keep rudders from jamming" on the Red Cloud. In spite of this, the rudders jam causing the schoolhouse wreck. The gas generator in the Red Cloud does not work as well when hot as it does when cold. (Most chemical reactions speed up when the temperature rise, making them more efficient, not less.) In spite of the claim that the craft will remain airworthy with "up to five cells of the gas bag" ruptured, a single punctured cell brings the craft down. In spite of the highly volatile and explosive nature of Tom's lifting gas, (and the fact that the aluminum "bag" apparently leaks like a sieve,) a lightning strike, gunshots, open flame and sparks from the motor exhaust do not cause the least concern. One of the biggest goofs is regarding the "rigid aluminum lifting bag." Tom makes it more buoyant by increasing the gas pressure inside. Lift is provided by displacing an increased volume of atmosphere with a gas of lesser molecular weight. Pressurization makes a rigid gas container heavier, not lighter.



The Red Cloud Airship - Estimated Dimensions

Another goof has to do with "altitude sickness." On p.49, at a height of 3000ft, Tom gets lightheaded and gasps from oxygen deprivation. Later, on p.144, dinner is consumed at an altitude of "3 miles" (15000+ft) and no one is the least bit bothered by the thin air.

Geography: Rocksmond, Blakefield and Shagmon are all population centers mentioned in the story within 100 miles of Shopton. Heavy forest cover is typical of upper NY State. While test-flying Red Cloud, at an altitude of only 500ft, Tom "can see neighboring cities and towns." In upstate New York, the topography routinely contains hills of up to 2500ft or more. At 500ft, the only view would be of shoreline villages around Lake Carlopa, and not many of them, considering the implied geometry and size of the lake. Below is a simulated view above "Shopton" at an altitude of 2500ft. At the altitude quoted in the story not even Waterfield, six miles distant, would be visible except as a small dot.

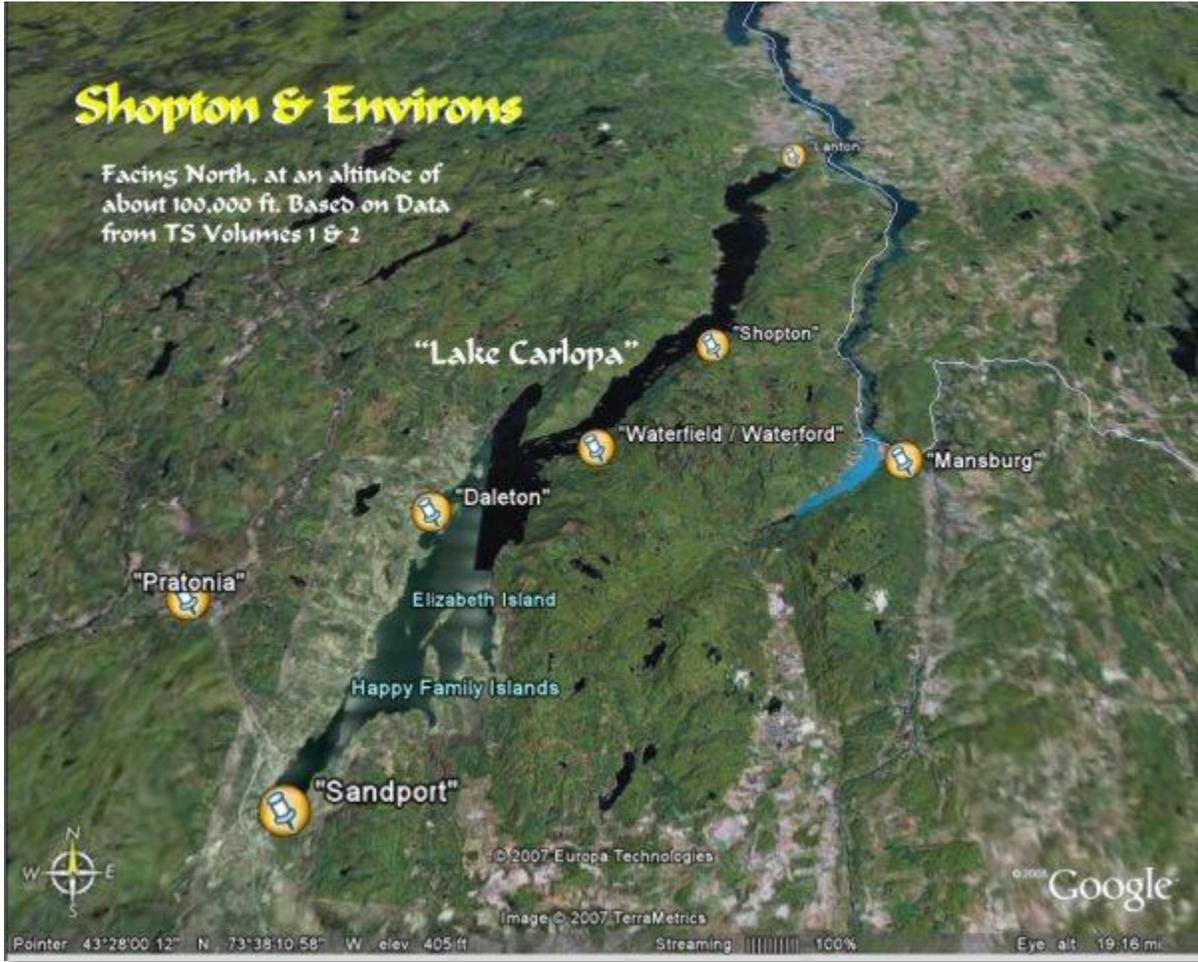


*View of Lake Carlopa above Shopton at 2500ft
Photo courtesy of Google Earth*

Mansburg is previously said to be the nearest commerce center/town/city of any size. It would be "out of sight" to the Southeast even at an altitude of 2500ft.

Note also, that due to the hilly terrain, level real-estate on which the future *Swift Construction Company* and its' attendant airfield(s) will be constructed, is at a premium.

The proposed countryside, overview, below, is based on the supposition that *Lake George*, in upstate New York, is the real world pattern on which Tom Swift's Universe was built.



*Proposed Layout of "Lake Carlopa" ca. Volumes 1 & 2
Photo courtesy of Google Earth*

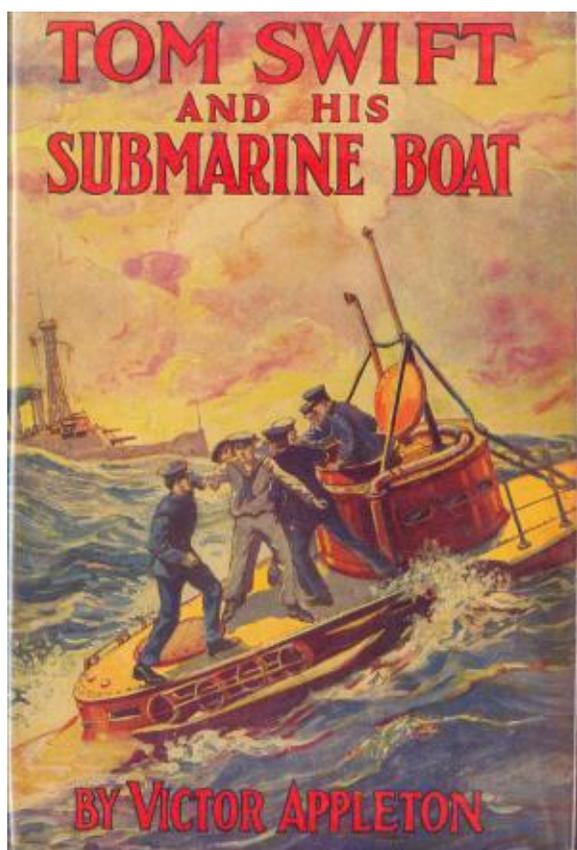
JP Karenko 4/01/05 Updated and expanded 2/07

#4. Tom Swift and His Submarine Boat (1910)

or, Under the Ocean for Sunken Treasure

Review by JP Karenko, May 2005

White Quad Dustjacket is from the collection of Mark Snyder.



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

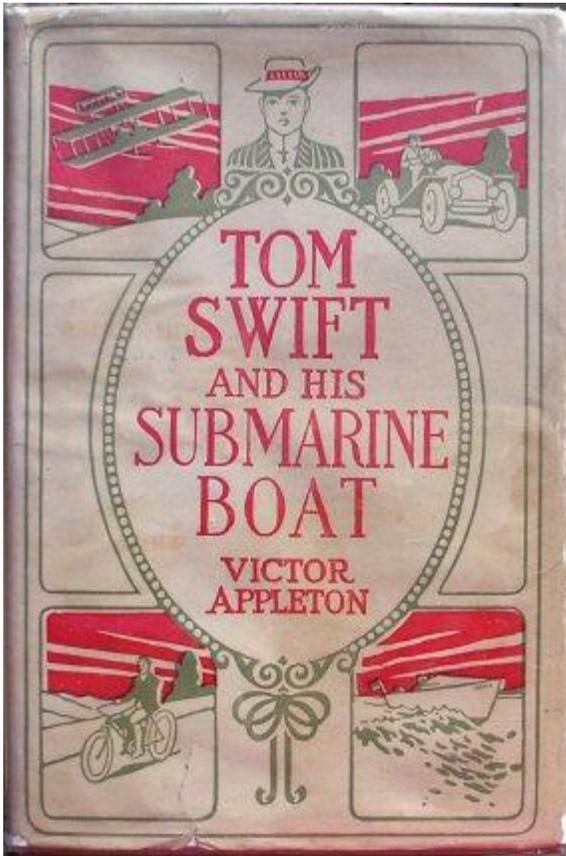
The book opens with Barton & son trying to complete Barton's prototype submarine in a shed on the New Jersey shore for a government competition. The winner would get a prize of \$50,000. When word is received of a shipwreck off the Uruguayan coast, plans get changed. The steamer *Boldero* is carrying \$300k in gold and has sunk at a depth of nearly 3 miles, far below the ability to reach with current submarine or diving technology. The *Advance*, the Swifts' new sub can dive that deep, and a new hard shell diving suit carried by the sub, can work outside at the 15k foot depth.

A rival sub building firm catches wind of the treasure hunt, and plans are laid to purloin the sunken gold. Two near-fatal incidents mark the sub's completion and shakedown cruise, but all obstacles are overcome (you expected otherwise?) and the voyage begins.

The B&E boat tracks the *Advance*, and an underwater battle ensues. You'll have to read the rest of the story to see how it ends.

Cast of Characters (More or less in order of appearance)

Barton Swift--Widower. Wealthy and conservative. Not flashy or pretentious. Inventor master machinist and holder of numerous patents. In this episode, described as "aged," "nervous," "distracted" and "feeble."



Mrs. Baggert--Housekeeper. Kindly, and "loves Tom like a son." Employed by the Swift family since the time Tom's mother died. She is short of stature and has to stand on a soap box to kiss Tom goodbye on one of his voyages.

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. Is a decent cook, too.

John Sharp--Professional balloonist and trapeze artist. Rescued by Tom when his hot-air balloon gets a bit *too* hot and burns. Deputy Sheriff as a sideline. Co-designer with Tom, of the Airship, *Red Cloud*. Tall, thin and 'dark' of complexion, he seems to now have given up speaking in short, choppy sentences, as in the 1st three books. "In residence" with the Swift family, has become sort of hands and feet for Tom's father.

Addison Berg--Representative of Bentley & Eagert (B&E), a Philadelphia submarine builder. Industrial spy and all-around bad guy. Hires Andy Foger to cause trouble for Tom.

Garrett Jackson--Aged (65+ years old) "engineer" who is more handyman/machinist and watchman type. Resides on Swift estate.

Andy Foger--Red haired, squinty-eyed bully, who makes great trouble for Tom. "Poor little rich kid," son of wealthy family, born with a chip on his shoulder. Reckless, blustery and angry. Showoff. "Has money, and not much else." Lately has upped ante to attempted murder when he traps Tom in an airtight compartment and leaves him to smother.

Mr. Foger--NFN given. Passing mention that he is on the Board of Directors of B&E.

Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro journeyman jack-of-all-trades. "Eradicates dirt." Gives the appearance of being lazy, but is actually a hard worker and entrepreneur/wheeler-dealer. Heavy deep-south accent and Uncle Remus attitude. Caretaker of mule **Boomerang**. In this tome, is limited to acting as estate watchman while the Swifts are voyaging.

Sam Snedecker--Cohort of Andy Foger. Voice of reason to Andy's scream of rage. No description given. Could be an OK guy if he were to stop associating with Andy Foger.

Pete Bailey--Cohort and willing minion of Andy Foger. No description given. Generic bad guy.

Ned Newton--Chum & companion of Tom, currently employed in Shopton National Bank. Ned has only a passing role in this tome.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. In this episode, he is "fond of good living." He had graduated from cycles to automobiles. In spite of ongoing trouble mastering most any conveyance he tries to control, has successfully piloted an airship.

Mr. Maxwell--NFN or description given. Minion of Addison Berg.

Mr. Bentley--NFN or description given. Bentley of Bentley & Eagert Subs Inc. Employer of Addison Berg. Bad guy.

Unnamed Hotel Clerk--Walk-on part. Single characteristic noted was a pinkie ring "with a large diamond." Hotels must pay well on the Jersey shore...

Captain Alden Weston--Soft-spoken and mild mannered sea captain hired by Swifts to navigate their sub to the South Atlantic. World traveler and soldier of fortune. Described as smooth of face and with merry blue eyes. Main characteristic is diffident, self-effacing language. Ends nearly every sentence with "if you don't mind" or "if I may say so" or variations of same.

Admiral Fanchetti--NFN or description given. Commander of Brazilian cruiser *San Paulo*. Much absorbed with gold braid and bluster. Also able to leap to false conclusions with a single bound. Adept at passing out death sentences.

Lieutenant Drascalo--NFN or description given. Fanchetti's hatchet-man, possibly XO. A one trick pony in that his dialogue is pretty much limited to shouting "Silence!" at every opportunity. Even the author makes note of this annoying trait...

Major Inventions

Tom Swift didn't really invent anything in this book. The submarine design was entirely his father's idea. He did use some of the things he invented in the past (such as his Airship), but other than some suggested "improvements" to the sub's details, and an impromptu "anti-clog device" made for a water valve, he didn't really invent anything new in this tome.

Barton Swift's sub itself would be a wonder, even today. At 100ft length and 20ft beam, it is a massive undertaking for an individual builder, even of the Swifts' renown. A total of 6 people supposedly constructed this machine. A similarly-sized boat was listed in *The Wonder Book of Knowledge* © 1921 as displacing about 170 tons, submerged. The hull is described as triple layered, with a secret material sandwiched between the plates for added (crush) strength. It is able to remain afloat even with 3 of its

many compartments flooded. It is also reputed to be able to remain submerged for 30 days or more. No top speed is given, except to describe it as "speedy." Based on a 3-day cruise to Bahama from NJ, (about 1000mi, straight-line) projected *sustained* speed of the *Advance* was calculated to be 14mph (12kt), a significant improvement over the 8-9kt *maximum* speed of "modern" subs of the 1920's. Layout is nearly today-modern, with a pilot house and conning tower forward, instead of amidships. Instrumentation, however, was suicidally basic. A compass, a depth meter and a speed indicator were **it**. Guidance was via an underwater searchlight, portholes and Mark One Eyeball. Proceeding aft, we find a luxurious lounge/mess room and galley. Further aft amidships, is the engine room and mechanical equipment areas. Behind the engine room are the sleeping quarters and storage areas. Propulsion is by a combination of "gasolene" engine (see errata) and motor dynamos, driving standard screws (for emergency only) and a new electrical hydrodynamic drive engaged through "peculiar plates" mounted on the bow and stern. An expandable lifting bag can be deployed for emergency floatation. A 6-seat electric launch is carried in a nest on the top deck for shore party use. The sub mounts 1 each "electric cannon" (much like today's rail guns) mounted fore & aft on swivels. These fire a 25 pound solid shot and were intended to repel "sea monsters." A standard ram is also mounted on the prow. The boat also has an airlock to deploy the hard shell diving suits.

The diving suits are all-metal, and require no air hoses or safety lines. Breathable environment is provided by "automatic air tanks." Jacques Cousteau may have read this tome as a youth and got the idea for modern SCUBA gear from it.

Commentary on Society, Attitudes, Environment & Errata

It's amazing how much society and technology have changed in 95 years. Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted. It also gives me an appreciation as to how much society has changed, too. I wonder what people will be taking for granted 100 years from now, and what they will think of our times? I believe Robert Heinlein put it best when he described our times as "The Crazy Years."

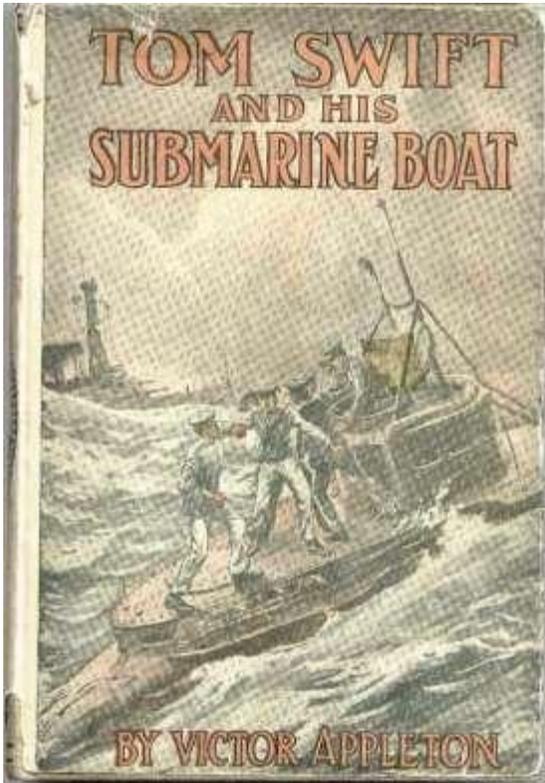
Attitudes and Prejudices: Racing for money used to be bad. Now, competing for government prize money is OK. Keeping a loaded rifle around to deal with intruders seems to be OK. Even after a near-fatal run-in with Andy Foger, Tom prefers to deal with him, personally, rather than involve the police. Only certain telephones seem to have long distance capability, and these are not common. Trolleys are used in Atlantis, which leads me to suspect Atlantic City (sizeable, even in 1910) was used as a model for this fictional town.

Americans are described as "filibustering dogs," and Brazilians are referred-to as "brown-skinned villains, scoundrels and rascals." Pretty strong language, even for the day.

The oceans are free: More like a free-for-all, by what is gotten away with in this tale. Much ado is made of unnamed "rights," and high-handed behavior seems the order of the day, while on the high seas. The B&E sub tries to crash Tom's boat from behind during their race. (Is this the forerunner of the Dale Earnhardt "bump?") Tom fires on them with his cannon "in self defense," and disables them, leaving them adrift. This is apparently OK, as "they started it." A Brazilian warship boards and tries to confiscate

(as in steal) the *Advance*, and captures Tom & his companions. They are imprisoned, tried for piracy and sentenced to death. This is because they are in an armed craft and showing no flag. No evidence. Might Makes Right, y'know...

Errata: Where to begin??? Porpoises were observed at a depth of 5000ft. According to findings published in *Diving and ranging behaviour of odontocetes: a methodological review and critique* by SASCHA K. HOOKER and ROBIN W. BAIRD, *Department of Biology, Dalhousie University, Halifax, Nova Scotia, B3H 4J1, Canada Mammal Rev.* 2001, Volume 31, No. 1, 81--105 , the maximum depth recorded was 250m. (~750 ft.) (The Internet is a wonderful place...)



Later in the story, giant sharks are encountered at a depth of 13,000ft. Again, the author blew it, as the deepest diving shark is the basking shark. Some of their dives were VERY deep, and go from the surface to over 850 m depth over a matter of hours and back again That is the deepest vertical range of any shark yet measured. (Nowhere NEAR the 2-1/2 mile depth in the story.) Sims, David W. *Threshold foraging behaviour of basking sharks on zooplankton: Life on an energetic knife-edge?* Proceedings of the Royal Society of Biological Sciences, Series B. 266(1427):1437-1443; 1999.

Tom disassembles a blocked ballast control valve during the shakedown and clears it without flooding the compartment. The sub has to have been a maze of shutoffs, but they are never mentioned.

During the shakedown, the sub is doing a speed run in 65ft of water. Even if the top speed were only 20kt, with no sonar and only a compass and depth gage, this would be suicidal. Shoals abound off the Jersey shoreline. Water deeper than 150 ft is 50+ miles offshore.

Engineering and Science, Fact vs. Fantasy: In this volume, it is apparent that some additional limits of the scientific knowledge of the author(s) have been revealed.

Gasoline engines (the prime mover in subs of the day) were discarded shortly after 1910 in favor of Diesels due to the explosion hazard. *Advance* still uses not only a gas engine, but one that can be run underwater for days at a time. The volume of air ANY internal combustion engine uses precludes running it submerged, unless sub is just below the surface using a snorkel. Even with an unlimited air supply, the exhaust would have to be ejected into the water or the boat would become inflated like a balloon. The trail of bubbles should be impressive.

The magical hydrodynamic drive is explained as using the same principle as magnetic poles to both attract and repel seawater, the bow of the *Advance* was charged negatively and the aft plate positively through "peculiar plates." Those plates sound like a great way to generate Hydrogen gas at one end of the boat and Oxygen at the other. Little spark, big noise, no sub.

Barton Swift and John are both shocked (Barton into unconsciousness) by the malfunctioning dynamo on the *Advance*. In spite of receiving "the majority of the current," neither is permanently harmed due to the "low voltage." As little as 10mA will stop a heart and DC is particularly nasty stuff with as little as 24v being potentially lethal. Good luck or poor writing?

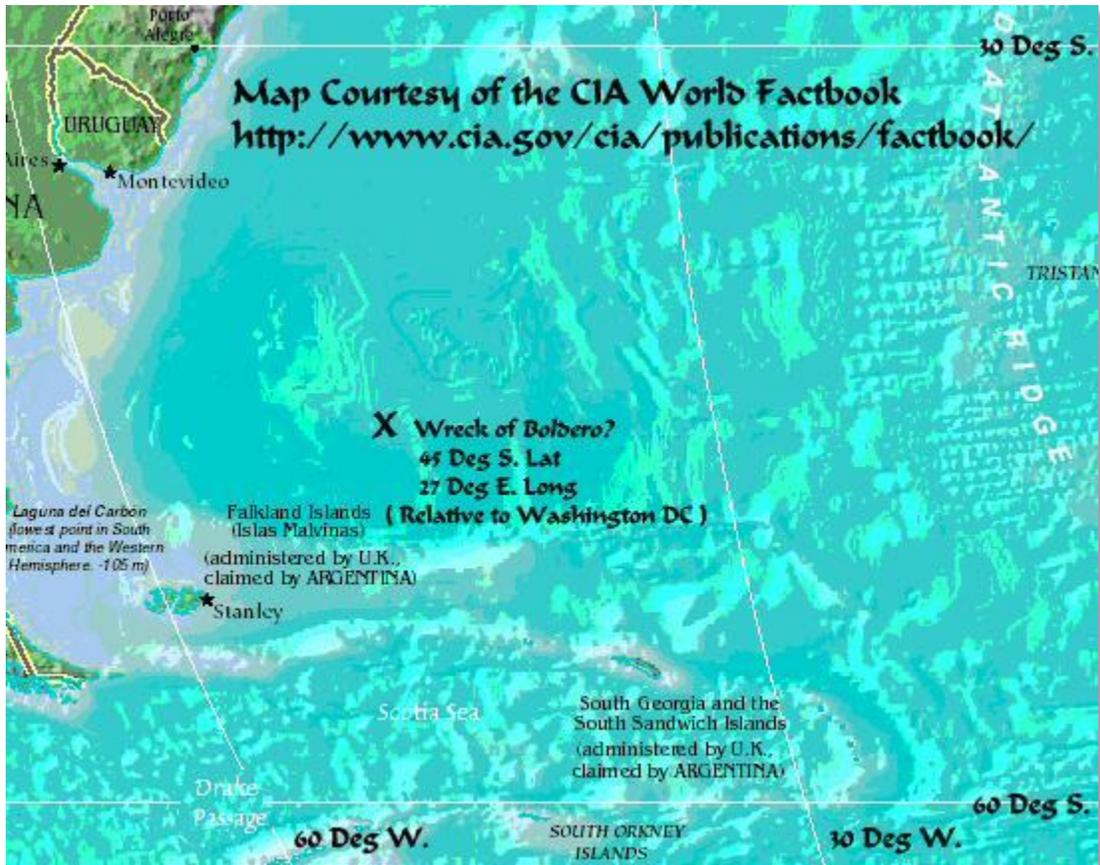
The electric cannon sounds like a good idea, but getting solid shot to go any distance under water is a losing proposition, due to water's density. That is why torpedoes carry a propulsion system on board. It is needed to overcome the drag as the projectile passes through the water over any distance.

Any naval commander who allows a capital ship to get caught in shallow water during a gale has to be incompetent, brain-dead or a political appointee. I suspect Admiral Franchetti may be all of the above. Besides, since when do "admirals" command something as piddly as a cruiser??? This popinjay's next command should be a rubber duck in a bathtub, or maybe a set of cement overshoes.

Finally, Tom uses a special code "47" to signal distress. I guess Sam Morse's code developed in 1844 and a simple CQD or SOS wouldn't do the job. In 1904, the Marconi company suggested the use of "CQD" for a distress signal. Although generally accepted to mean, "Come Quick, Danger," that is not the case. It is a general call, "CQ," followed by "D," meaning distress. A strict interpretation would be "All stations, Distress." At the second Berlin Radiotelegraphic Conference in 1906, the subject of a danger signal was again addressed. Considerable discussion ensued and finally SOS was adopted. The thinking was that three dots, three dashes and three dots could not be misinterpreted. It was to be sent together as one string. This signal was officially adopted in the US in 1908, after much foot-dragging. As an aside, *Titanic* used both calls while sinking.

Geography: "Atlantis, NJ" is a resort town, nearest to where the Swifts have set up seaside operations. Shopton is "one day's flight" from that seaside base. The *Red Cloud* is now capable of 90mph top speed, and if an 8 hour trip is stipulated at a normal cruise speed of 40-50mph, that puts it about 400 miles north of the Jersey shore. A check of *DeLorme* map software shows a straight line distance from Atlantic City to Burlington, VT (near where I speculate "Shopton" is located) to be 350 miles.

Grand Bahamas Island is about 1000 miles from that part of Jersey, and since the *Advance* has a cruising radius of "about 250 miles per day," that bodes well for the 12kt sustained speed of the boat. On the other hand, the 45S Lat and 27E Long wreck location is MUCH further than the approximate 6-day voyage from Bahamas as stated. This is in addition to having to put up with bad guys, warships and sea-monsters. (An "octopus" <sic> tries them on for size on p194 and gets the *en brochette* treatment with the prow ram.)



As to the location of the wreck, the longitude is stated as 27E *from Washington DC* (which is located 75W from Prime Meridian.) This would put the wreck somewhat near to the SA coast, but still a long way out. Water depth is charted as *up to* 13,000 feet. All this means the wreck location could be plausible, and just deep enough for the 2-1/2 mile depth stated in the book.

JP Karenko 5/2/05

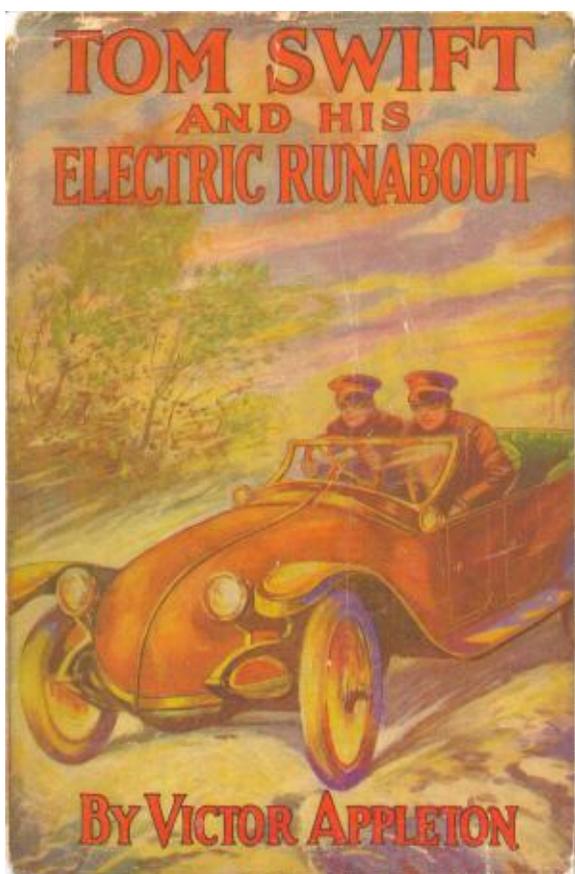
#5. Tom Swift and His Electric Runabout (1910)

or, The Speediest Car on the Road

Review by JP Karenko, May 2005

Full-color image from the collection of James D. Keeline

White Quad, Brown Quad and Duotone images from the collection of Mark Snyder



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

The book opens with Barton Swift & son discussing a trip to Long Island, NY, to enter a race for electric automobiles. Tom has been working on a new rechargeable battery that he feels would be ideal for use in a racing automobile, due to its' endurance and quick-charge capabilities. The discussion is interrupted by a series of violent noises coming from the roof of the house. Mr. Damon has added airships to the list of vehicles he has crashed while piloting, by tangling the *Red Cloud's* running gear (See Book #3) in the house's chimney.

Tom has another run-in with Andy Foger, who now is driving a new 4-speed auto. This further hardens his resolve to build the "Speediest Car on the Road," one with a 100mph top speed. The Fogers, (father and son) have it in for the Swift family, and now plan to ruin them financially by breaking the bank where Tom & Barton keep their funds. The FDIC had not yet been invented, and running out of cash could cause a bank to fail, when

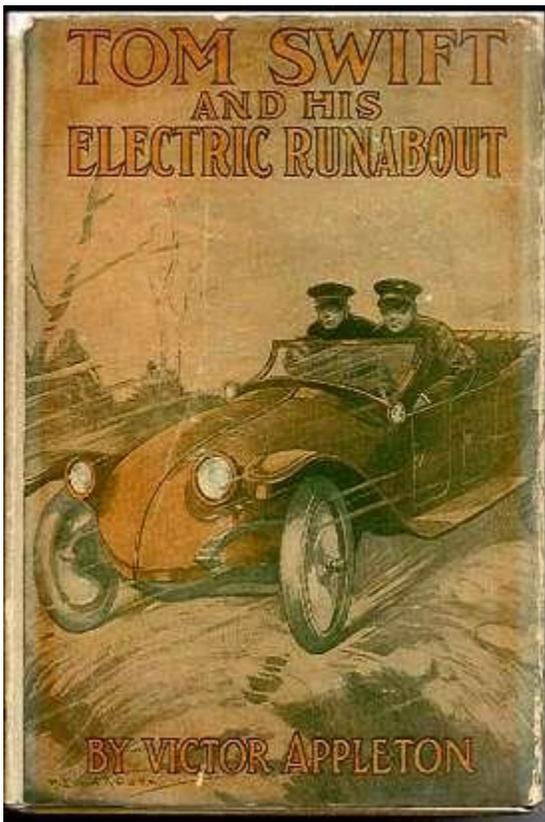
depositors lost faith in the institution and withdrew their deposits.

Not willing to wait for financial ruin to set in, Andy and his cohorts Sam & Pete, join a gang called *The Deep Forest Throng*, and kidnap Tom. Tar & feathers as well as some lumps, are in Our Hero's future. Tom also manages to survive near-electrocution, when an old nemesis sabotages his new machine. Poor Tom, who is now a bit tattered and crispy around the edges, vows to stay home and out of trouble, for a while. (Yeah, right!)

A solution to the bank's problems, and mastering the rigors of racing 500 miles in a prototype vehicle are all told in the remainder of the story.

Cast of Characters (More or less in order of appearance)

Barton Swift--Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. In this episode, described as "aged" and "nervous." In this tome, he becomes a director on the board of Shopton's (First) National Bank.



Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. Is a decent cook, too.

John Sharp--Professional balloonist and trapeze artist. Rescued by Tom when his hot-air balloon gets a bit *too* hot and burns. Deputy Sheriff as a sideline. Co-designer with Tom, of the Airship, *Red Cloud*. Tall, thin and 'dark' of complexion. "In residence" with the Swift family, has become sort of hands and feet for Tom's father.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. In this episode, he has graduated from crashing motor-cycles & automobiles to crashing airships. He parks the *Red Cloud* on the roof of Tom's house. This damages both it and the house's chimney. Meanwhile, he blesses everything in close proximity. Later, he becomes a director on the board of Shopton National Bank.

Mrs. Baggert--Housekeeper. Kindly, and "loves Tom like a son." Employed by the Swift family since the time Tom's mother died. She is short of stature and has to stand on a soap box to kiss Tom

goodbye on one of his voyages. Excitable, she seems to expect fatalities after any mishap involving Tom's inventions. The airship on the roof causes her much worry.

Garrett Jackson--Aged (65+ years old) "engineer" who is more a handyman/machinist and watchman type than engineer. Resides on Swift estate.

Andy Fogger--Red haired, squinty-eyed bully, who makes great trouble for Tom. "Poor little rich kid," son of wealthy family, born with a chip on his shoulder. Reckless, blustery and angry. Showoff. "Has money, and not much else." Lately has upped ante to kidnapping Tom. (See Deep Forest Throng, below.)

Sam Snedecker--Willing cohort of Andy Foger. No description given except for "large ears.". Could be an OK guy if he were to stop associating with Andy Foger, but seems to be going downhill, character-wise. (See Deep Forest Throng, below.)

Pete Bailey--Cohort and willing minion of Andy Foger. No description given. Generic bad guy. (See Deep Forest Throng, below.)

Mr. Foger--NFN given. Starts a new bank in town (Two "national" banks in a "village." Hm!) He tries to ruin Swifts financially by causing a "run" on their (1st national) bank.

Ned Newton--Chum & companion of Tom, currently employed in Shopton 1st National Bank as a newly promoted assistant cashier.

Miss Mary Nestor--Budding love interest who lives in neighboring town of Mansburg. Described as a "fair young woman with flashing brown eyes." Blushes easily, especially around Tom.

Captain Alden Weston--Soft-spoken and mild mannered sea captain, world traveler and soldier of fortune. Hired by Swifts to navigate their sub in book #3. Described as smooth of face and with merry blue eyes. Main characteristic is an apologetic, self-effacing language. Ends nearly every sentence with "if you don't mind" or "if I may say so" or variations of same. In this tome, plays no direct role, but is said to have invested his share of the submarine gold promoting "a South American revolution."

The Deep Forest Throng--Gang of ten or twelve bumbling ne're-do-wells. Black hooded "secret society" that isn't all that secret, since most are ignorant enough to use each other's names during hooded nefarious activities. They waylay and kidnap Tom with intent to tar & feather him for the crime of "being uppity." Members include **Cecil Hedden**, the leader, **Jack Reynolds**, **Sid Holton**, **Andy Foger**, **Sam Snedecker**, **Pete Bailey**, and unnamed others.

Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro journeyman jack-of-all-trades. "Eradicates dirt." Lately, acts as watchman to keep intruders away from Swift property. Armed with a bucket of whitewash. Heavy deep-south accent and Uncle Remus attitude. Caretaker of **Boomerang**, a cantankerous aged mule.

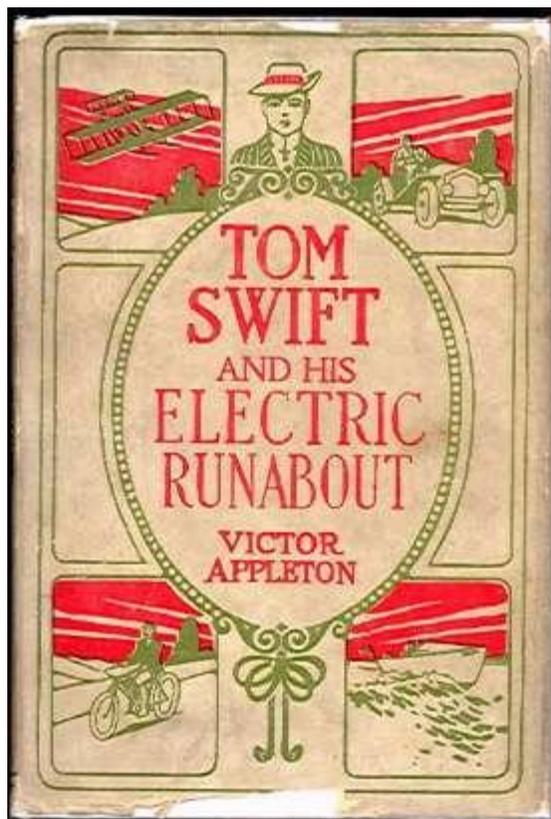
Mr. Mason--NFN or description given. Seems to know Tom, but has not been previously introduced in other stories. (See errata.)

Addison Berg--Ex-representative of Bentley & Eagert, a submarine building firm. Industrial spy and all-around bad guy. Sabotages Tom's motor experiment causing Tom to be near-electrocuted. Trying to steal the secrets of Tom's new battery cell. Cohort of Andy Foger's father at new bank in town.

Dr. Whiteside--NFN or description given. Town physician, renders aid to Tom when he is shocked during a botched experiment with the runabout motor. Offices in his home.

Miss Whiteside--NFN or description given, except "pretty." Daughter of town doctor, nurses Tom back to health.

Paul Layton--No description given. Auto enthusiast from nearby Netherton, who races Tom with a 6 cylinder, 4-speed roadster at 60mph on rutted dirt roads.



Isaac Pendergast--President of Shopton 1st National Bank. Aged, pompous & blustery. Ned Newton's boss. In this tome, not so blustery, as his institution is threatened with failing.

Mr Chase--NFN or description given. Official of Clayton National Bank. Acquaintance of Mr. Damon.

Gang of Masked Armed Highwaymen--Recently escaped from jail. Possibly in collusion with Addison Berg or Mr. Fogger, since they know about the cash transfer, timing and route Tom & Mr. Damon are taking.

Jethro Lyon--No description given. Farmer from Salinas Township. Aids Tom & Mr. Damon during attempted robbery.

Ade & Burt Lyon--No descriptions given. Sons of Jethro. Aid Tom & Mr. Damon during attempted robbery.

Bub Armstrong--No description given. Nephew of Jethro Lyon. Aids Tom & Mr. Damon during attempted robbery. Expert with a bullwhip. Able to simulate fusillade of gunshots.

Miss Mary Nestor--Seen in an "immaculate Summer gown" and gloves. Love interest of Our Hero. Journeys to Long Island to see Tom race his Runabout. (Is this devotion, or what???)

Major Inventions

Tom Swift finally invents something major in this book. Several somethings, actually. First is a new technology wet-cell rechargeable battery. This is based on Nickle Oxide, Ferric Oxide and Steel tubes with a Lithium Hydrate (See errata) electrolyte. This cell can be recharged in half the time as the usual wet cell, and has a quantum increase in energy density.

Electric vehicles of the day, while not unusual, had poor performance and desperately needed "improving." Tom sets about to design a 4-seat runabout that was intended to attract the attention of a major manufacturer. Innovations for this vehicle include: Mid-body running gear consisting of 2-speed *geared* twin electric motors driving the rear wheels through motorcycle-type chains. Battery compartments were distributed front, rear and midline, presumably for best balance. A 4th "reserve" battery was carried for emergencies. Two spare wheels, a tire repair kit and tools were kept under the rear seat. Body construction was steel, pointed and sloped (aerodynamically shaped, at least for that day) and included a raise-able steel

wind screen with celluloid window. These streamlining items, plus a tonneau cover and leather side curtains all contributed to low drag for increased top speed. In addition to the usual oil headlights, a powerful electric spotlight could be used for nighttime travel. The appearance of the vehicle was enhanced by a distinctive purple paint job, protected with multiple coats of varnish. Battery charging could be accomplished from either a regular "charging station," or hookup to a trolley line or street lamp. No mention if overall weight was given, but this baby must have been a low-rider, and weighed a ton. (Or more!)

The initial intended range was to be 300-400 miles with 2 passengers, and a top speed on smooth road of 100mph. This kind of performance would be impressive, even today, except for the lack of creature comforts, like heat, air, power steering and satellite radio...

Commentary on Society, Attitudes, Environment & Errata

It's amazing how much society and technology have changed in 95 years. Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted, (like my Olds Alero.) It also gives me an appreciation as to how much society has changed, too. I wonder what people will be taking for granted 100 years from now, and what they will think of our times? I believe Robert Heinlein put it best when he described this era as "The Crazy Years."

Attitudes and Prejudices: Language usage is interesting at times. A reference was made to a "catty" on p31, as some kind of lever. An extensive Google search turned up only 2 references: Most common was the usual reference to nasty or coy attitude.

UPDATE: The "catty" mentioned in the book has been located! Here is the definition from the Oxford English Dictionary:

cat (___), n.1 Forms: 1 catte, catt, 2,7 catt, 4,6 catte, (3,7 kat, 6 katte), 1, cat.

10. A term used in various games.

a. A small piece of wood tapering at each end, used in the game of tip-cat, etc.; it is hit at one end by the cat-stick, and made to spring from the ground, and then driven away by a side stroke.

1598 Florio, *Lippo*, a trap or cat, such as children play at.

a1627 Middleton *Wom. beware Wom.* i. ii, Prithee, lay up my cat and cat-stick safe.

a1652 Brome *New Acad.* iv. i. Wks. 1873 II. 66 All my storehouse of tops, gigs, balls, cat and catsticks.

1801 Strutt *Sports and Past.* 101 (N.) The cat is about six inches in length, and an inch and a half or two inches in diameter, and diminished from the middle to both ends, in the manner of a double cone.

b. The game itself; tip-cat.

1626 in *Windsor & Eton Gaz.* (1886) 6 Mar. 4/5 Playing at Catt in the Parke medow.

1653 J. Taylor (Water P.) *Journ. Wales* (1859) 26 The lawful and laudable games of trapp, catt, stool-ball, racket, etc.

1801 Strutt *Sports & Past.* ii. iii. 101.

1885 J. Brown *Bunyan* 61 He was one Sunday in the midst of a game of cat.

Some pictures of a "catty" have been located as well. The following images are taken from the Laurel & Hardy film *March of the Wooden Soldiers* and are copyright (c) 1991 by MGM Studios.





The other was an oriental measure used in commerce, with a mass of around 500grams. A reference to "scaring Mrs. Zenoby's cat," turned up exactly nothing. Shoes had buttons, and stoves (presumably cast-iron) required regular maintenance with a "blacking" polish. I presume this was to prevent or perhaps, conceal rust.

Captain Weston, as a US citizen, seems to be able to finance a South American revolution. Mr. Damon is ordered to drink lemon juice by his doctor, to aid in healing his ailing liver.

The media is already up to its' tricks of misrepresenting and exaggerating "facts." Tom's car is reported to have a top speed of 500mph, and to travel without touching the ground.

Speed laws are apparently only enforced inside towns and villages. Considering most roads are dirt, one-lane with ditches on both sides and have soft spots and ruts, this is probably adequate.

Segregation is commonplace and "normal" with Rad going to "a colored dance." Reference to "darkies" was descriptive, rather than a "racial epithet," as we call it, today.

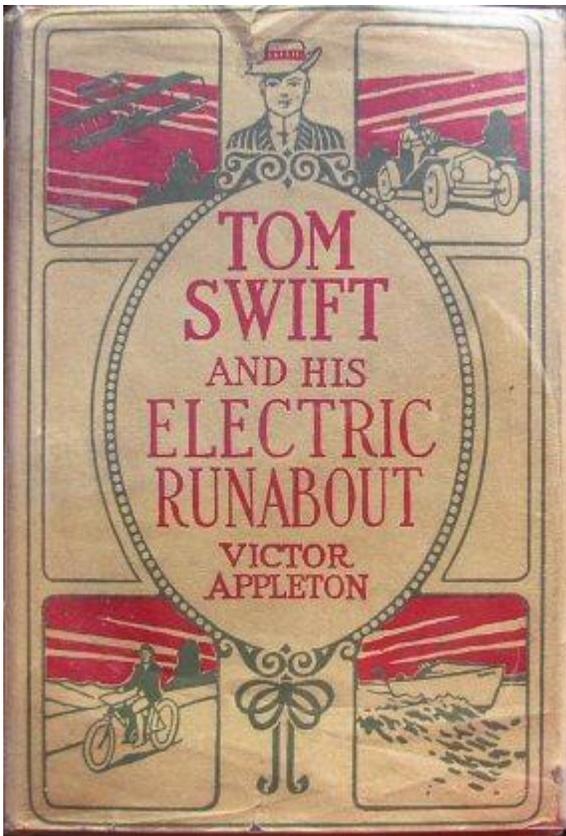
At least some folks appeared to be incredibly naive in this story. After being accosted by armed and masked men, who met ALL of today's legal requirements for committing armed robbery, Tom & Mr. Damon speculate as to whether the death threats, demands for the cash and the display of firearms was "just to delay or frighten them." <Duh!>

Errata: Typos were few and far between. On p48 a reference was made to "pump it up out lamps." The (out) may have been an error, or the demountable headlights on Mr. Damon's car may have been a Coleman lantern type and really did need periodic pumping. The reference in the text seemed to relate to a tire pump. On p178, "I don't draw out" probably was intended to be "won't," referencing a bank deposit.

Tom's father is invited to ride on the first test of the runabout, and declines. However, he is later in the ride, quoted as teasing Tom, even though not present.

Tom gets sufficiently "lit up" by some sabotaged wires, to lose consciousness and "need his heart action adjusted" by the town doctor. Since as little as 24 DC volts can be lethal, one wonders, how he manages to survive repeated jolts of current. His shock was described as "from hand to hand," the worst kind. If his heart action was disrupted enough for him to go unconscious, I suspect that in any real world, by the time he was taken to the doctor, he'd be dead.

Tom's runabout is described as "the speediest car on the road," but the robbers who waylay him & Mr. Damon, seem to be able to move around faster, getting informed of the cash transfer, and organizing not one, but two ambushes, 20 miles apart. Go figure.



Engineering and Science, Fact vs. Fantasy: In this volume, it is apparent that the knowledge of the author(s) at least as to what makes a "good" electric vehicle is at least adequate. The runabout features and specifications would be impressive, even today.

Designing this beast in 3 to 4 days and building it from the ground up in 3 months, working alone, is however, fantasy. Insulation on wiring was either very poor or altogether missing. Crossed wires and repeated exposure to current resulted in re-volting developments, and many fireworks, story-wise.

Tom's battery chemistry sounds fishy. Thomas Edison developed a Lithium/Iron battery about that time (1906) but it was a primary (non-rechargeable) cell. Lithium ion technology was unheard-of and when it finally was tried, 60 years after this story, the explosion hazards of overcharging limited its applications, at least for a while. When asked, my local battery expert, Dr. Keith Shaw, stated simply, "the chemistry wouldn't work."

As to chemistry, the Lithium *Hydrate* that Tom threw in a fire to escape kidnappers would burn (if at all) with a reddish-to-white flame, not blue, and would hardly explode, as was described in the text. It was also nothing to carry in a pocket, as Tom did, since it is corrosive. Lithium *Hydride* liberates Hydrogen, but must be wet to do so. As to "rumbling" gunpowder, at least in small quantities, even black powder makes a "poof" or a sizzle, unless confined.

Tom's machine suffers from repeated tire troubles. The 30 inch diameter tires of the day, were tube-type with no tread to speak of. Tread (for rear wheels only) was not introduced for another 10 years.

Running a smooth, un-reinforced tubed tire at 80 or 100mph would be suicidal, especially on rutted dirt roads. What the authors apparently did not realize was that "racing" tires, capable of even faster speeds, were solid. If a tire let go, the result was usually fatal, sometimes to anyone even close to the event. Chunks flew everywhere. Based on this, a good follow-up story would be *Tom Swift and His Steel-Belted Radial Tires*.

Tom suffers two blowouts in 500 miles, and is forced to pit stop to change wheels. His pit stop took 5 minutes (Dale Earnhart must be rolling in his grave) and during that time, his competition got a lap lead on him. Since they were on a 5 mile oval, this means that average race speeds were a blistering 45mph, nothing near the top speed of 100, claimed by Tom for the runabout, and very slow, compared to (Stanley) steamer car races of that era, which exceeded 100mph, consistently. Authors may have also been mathematically challenged.

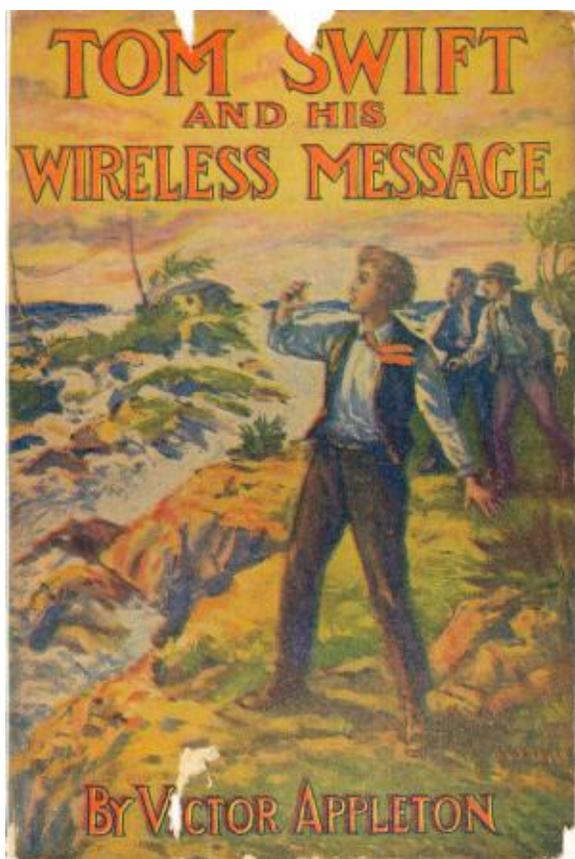
Geography: We find that Ned Newton's home is about a mile beyond the far village limit of Shopton. The local high spot (altitude-wise) is something called "Berk's Hill," and was considered a driving hazard for local vehicles. Mansburg, home of Mary Nestor, is described as near the head of the lake (Carlopa.) In other volumes, the lake is described as much larger, with Mansburg being close to Shopton, and Shopton midway up the East shore of the lake. Waterfield (where the authors have finally decided to consistently place Mr. Damon's home) is beyond Mansburg, but close enough for a casual jaunt via motor cycle, horse, carriage or auto, all of which Mr. Damon has managed to lose control over. There is a new village (Netherton) which is mentioned, but with no direction or distance given. The city of Clayton is said to be 40 miles distant, but in an unspecified direction, except to say that the road there was hilly, with cliffs and in mostly poor shape. Bridges over rivers and streams were in many cases described as "frail" and could not be crossed at speed. On the Jersey shore, Tom's HQ (the submarine cottage) was an "easy run" from Havenford, LI, the location of the *Tourng Club of America's* new race track. I had placed it further south, near Atlantic City, (Atlantis,) in the book.

JP Karenko 5/8/05

#6. Tom Swift and his Wireless Message (1911) (Review 1)

Or, The Castaways of Earthquake Island

White Quad, Brown Quad and Duotone images are from the collection of Mark Snyder



Summary: None of the original Tom Swift Sr. books came with summaries. However, the events of the book can be summed up as follows:

The book starts out when Tom's trusty servant, Eradicate, gives Tom a telegram. The telegram, which was sent by a wealthy inventor, asked Tom Swift to fly up to Philadelphia to help perfect an electric airplane. After discussing the matter over with his father, Tom agreed to help the inventor and he and Mr. Damon flew to Philadelphia.

The inventor's airplane, which was called the *Whizzer*, was badly built and in need of extensive changes. At first Tom despaired of ever getting it to fly, but after a lot of hard work the plane was overhauled and made air-worthy.

As soon as the overhaul was complete, Tom Swift told Mr. Fenwick that he wanted to take the plane on a trial trip to see how well it performed. After stocking the plane with food, Mr. Fenwick, Tom, and Mr. Damon boarded the plane and started it up. At first the plane could not leave the ground; however, after Tom regeared the motor the lumbering craft rose off the ground, and two days

later the trio departed on their journey.

After an uneventful flight to New Jersey, a violent storm that had been brewing hit with full force and carried the aircraft hundreds of miles out to sea. The *Whizzer*, clumsy and heavy though it was, managed to stay in the air for some time but eventually the aircraft crashed onto a barren island. Nobody was seriously injured as a result of the crash, but the airplane was a complete loss; there was no way that it would ever fly again. The group was marooned!

Soon after the trio had crashed onto the island they discovered that Mr. and Mrs. Nestor -- the parents of Tom's girlfriend -- were also on the island. After talking with the Nestors, Tom discovered that the yacht that they had been on had been beached by of the storm.

The Nestors, however, were not the only people that were on board the yacht when it was marooned. One of the other people that had been on board was a noted disaster-predicting scientist by the name of Mr.

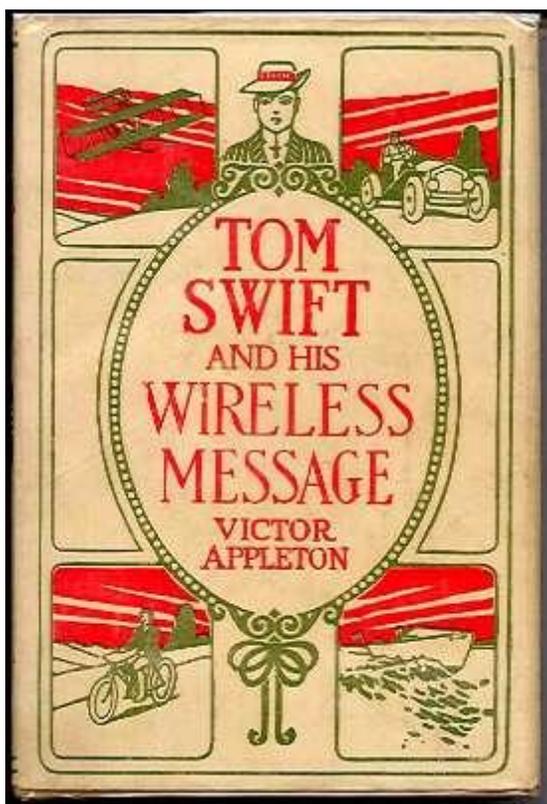
Parker. Mr. Parker, true to his character, predicted that the earthquakes that frequently racked the island were going to destroy it soon and kill them all. If that wasn't bad enough, the captain of the yacht said that the island was off the beaten path of ship lanes; the group thus had no chance of being sighted by a ship.

How did the group get off the island before it sank beneath the sea and killed them all? How did Tom Swift save the day? To find out the answers to these questions you'll have to read the book *Tom Swift and his Wireless Message*.

Major Inventions

As is sometimes the case in the Tom Swift Sr. series, Tom Swift did not invent anything new in the course of the book. He did, however, have a hand in the construction of two already-invented inventions, and that is what I will talk about here.

The first thing that Tom Swift played a part in was the perfection of Mr. Hosmer Fenwick's **electric airplane**. The electric airplane is a rather interesting idea that had a simple concept behind it: instead of running on gasoline, this airplane was run by an electric current.



Building an airplane that runs on electricity was no mean feat. An electric airplane poses a number of difficult technical challenges. The inventor overcame these challenges by inventing a motor that uses gasoline to produce an electric current. The electric current is used to power an electric motor, and the electric motor turns the propellers:

...and Tom and Mr. Damon, looking in, saw a large triplane, with a good-sized gas bag hovering over it, and a strange collection of rudders, wings and planes sticking out from either side. Amidships was an enclosed car, or cabin, and a glimpse into it served to disclose to the young inventor a mass of machinery...

There was certainly plenty of machinery in the cabin of the Whizzer. Most of it was electrical, for on that power Mr. Fenwick intended to depend to sail through space. There was a new type of gasoline engine, small but very powerful, and this served to operate a dynamo. In turn, the dynamo operated an electrical motor, as Mr. Fenwick had an idea that better, and more uniform, power could be obtained in this way, than from a gasoline motor direct. One advantage, which Tom

noticed at once, was that the Whizzer, had a large electric storage battery.

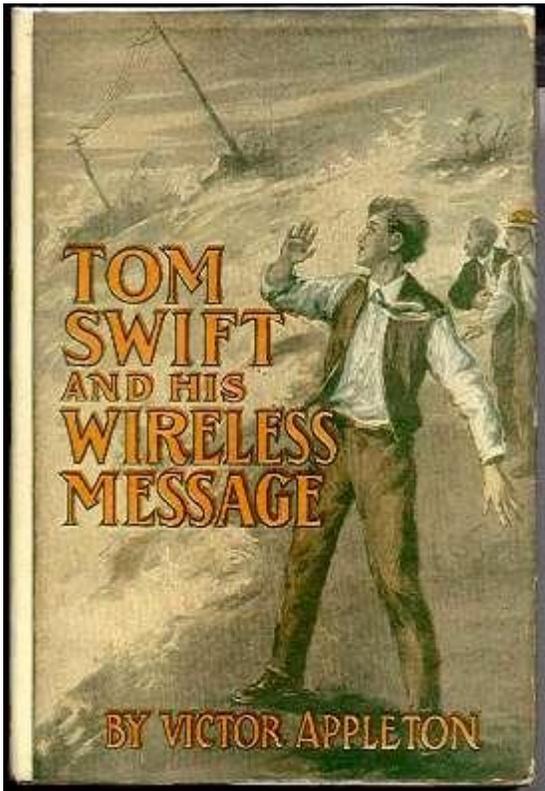
This was intended to operate the electric motor in case of a break to the main machinery, and it seemed a good idea. There were various other apparatuses, machines, and appliances, the nature of which Tom could not readily fathom from a mere casual view.

There is more to consider when building an airplane than just its power source, however, and while the inventor was a whiz at electrical devices, he fell down badly in other areas. At first, in fact, Tom was aghast at all of the changes that needed to be made: not only did the planes need adjusting, the engine itself also needed extensive work:

..."I think that there is one trouble that we will have to get over," he finally said to Mr. Fenwick.

"What is that?"

"The motor is not quite powerful enough because of the way in which you have it geared up. I think by changing some of the cogs, and getting rid of the off-set shaft, also by increasing the number of revolutions, and perhaps by using a new style carburetor, we can get more speed and power.



..."Do you think it will work after that?"

"Well," remarked Tom hesitatingly, "I think the arrangement of the planes will also have to be changed. It will take quite some work, but perhaps, after a bit, we can get the Whizzer up in the air."

In the end, of course, Tom Swift did get the *Whizzer* to fly, although it was a goodly piece of work.

The second invention that the book deals with is the **electric wireless** -- or to translate that into modern English, the radio. Now, the book does not claim that Tom Swift either invented or improved the electric wireless. In fact, all he did was simply build one. The building of one, however, was an impressive feat -- after all, not everybody can build a radio out of the wreckage of an airplane.

The wireless outfit that Tom built was *vastly* different from the nice, simple, clean, compact radio sets that we are so familiar with today. In fact, radios have changed so much over the years that I imagine if the average American were to stumble across one he wouldn't have any idea what it was used for. The change in equipment has really been that dramatic.

What were some of the dramatic differences? Well, one of them was the fact that the wireless set Tom built made a horrendous noise:

Suddenly, overhead, there sounded a queer crackling noise, a vicious, snapping, as if from some invisible whips.

"Mercy! What's that?" cried Mrs. Nestor.

"The wireless," replied Tom, quietly.

The book Tom Swift and His Ocean Airport went even further, stating that the noise made by the average ship's wireless was almost enough to deafen a man. Somewhere down the line, somebody figured a way out to make wireless sets silent and I am very grateful.

The wireless station that Tom built also needed a whole host of complex equipment. The purpose of some of this equipment I can readily gather (the key was likely used to send Morse code messages), but some of the equipment completely boggles me (what would carbons and needles be used for, and what in the world is a coherer?):

He related how he had set up the dynamo and gasoline engine, and how, by means of the proper coils and other electrical apparatus, all of which, fortunately, was aboard the Whizzer, he could produce a powerful spark.

"I had to make a key out of strips of brass, to produce the Morse characters," the lad said. "This took considerable time, but it works, though it is rather crude. I can click out a message with it."

"That may be," said Mr. Hosbrook, who had been considering installing a wireless plant on his yacht, and who, therefore, knew something about it, "you can send a message, but can you receive an answer?"

"I have also provided for that," replied Tom. "I have made a receiving instrument, though that is even more crude than the sending plant, for it had to be delicately adjusted, and I did not have just the magnets, carbons, coherers and needles that I needed. But I think it will work."

"Did you have a telephone receiver to use?"

"Yes. There was a small interior telephone arrangement on Mr. Fenwick's airship, and part of that came in handy. Oh, I think I can hear any messages that may come in answer to ours."

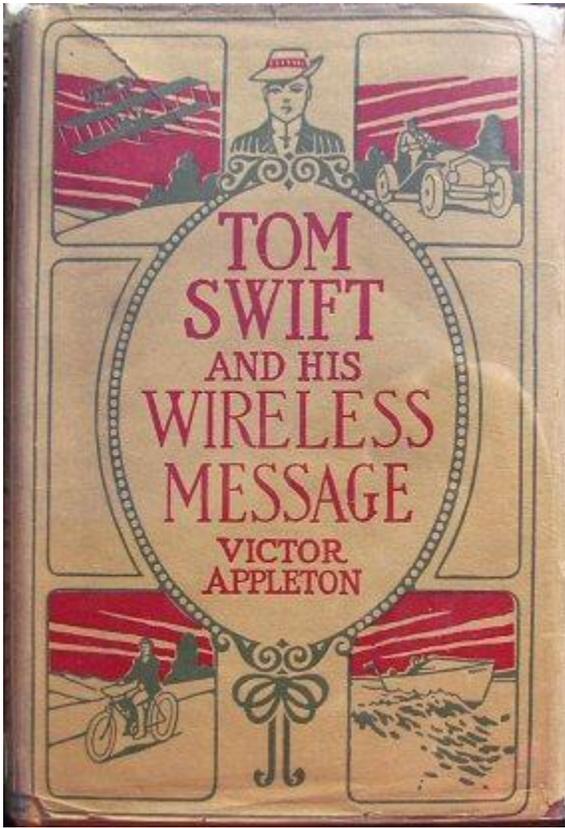
"But what about the aerial wires for sending and receiving messages?" asked Mr. Nestor. "Don't you have to have several wires on a tall mast?"

"Yes, and that is the last thing to do," declared Tom...

"Have you got the wire?" asked Mr. Jenks.

"I took it from the stays of the airship," was Tom's reply...

To further highlight the differences between Tom's wireless and the modern radio, I have copied the passages that deal with the principles by which Tom's wireless worked and posted them here:



"But I can't understand how you are going to do it," said Mrs. Nestor. "I've read about wireless messages, but I can't get it through my head. How is it done, Mr. Swift?"

"The theory is very simple," said the young inventor. "To send a message by wire, over a telegraph system, a battery or dynamo is used. This establishes a current over wires stretched between two points. By means of what is called a 'key' this current is interrupted, or broken, at certain intervals, making the sounding instrument send out clicks. A short click is called a bot, and a long click a dash. By combinations of dots, dashes, and spaces between the dots and dashes, letters are spelled out. For instance, a dot and a space and a dash, represent the letter 'A' and so on."

"I understand so far," admitted Mrs. Nestor.

"In telegraphing without wires," went on Tom, "the air is used in place of a metallic conductor, with the help of the earth, which in itself is a big magnet, or a battery, as you choose to regard it. The earth helps to

establish the connection between places where there are no wires, when we 'ground' certain conductors."

"To send a wireless message a current is generated by a dynamo. The current flows along until it gets to the ends of the sending wires, which we have just strung. Then it leaps off into space, so to speak, until it reaches the receiving wires, which we have just strung. Then it leaps off into space, so to speak, until it reaches the receiving wires, wherever they may be erected. That is why any wireless receiving station, within a certain radius, can catch any messages that may be flaying through the air--that is unless certain apparatus is tuned, or adjusted, to prevent this."

"Well, once the impulses, or electric currents, are sent out into space, all that is necessary to do is to break, or interrupt them at certain intervals, to make dots, dashes, and spaces. These make corresponding clicks in the telephone receiver which the operator at the receiving station wears on his ear. He hears the code of clicks, and translates them into letters, the letters into words and the words into sentences. That is how wireless messages are sent."

And do you propose to send some that way?" asked Mrs. Anderson.

"I do," replied Tom, with a smile.

On another note, Tom's wireless set had a rather odd problem: Tom couldn't guarantee that someone could receive a message that he sent out. To find out why, read the following passage:

"Do you mean to say that you can catch messages flying back and forth between stations now?" asked Mr. Fenwick.

"Yes," replied the young inventor, with a smile. "Here, listen for yourself," and he passed the head-instrument over to the Whizzer's former owner. The latter listened a moment.

"All I can hear are some faint clicks," he said.

"But they are a message," spoke Tom. "Wait, I'll translate," and he put the receiver to his ear, "'Steamship "Falcon" reports a slight fire in her forward compartment,'" said Tom slowly. "'It is under control, and we will proceed.'"

"Do you mean to say that was the message you heard?" cried Mr. Damon. "Bless my soul, I never can understand it!"

"It was part of a message," answered Tom. "I did not catch it all, nor to whom it was sent."

"But why can't you send a message to that steamship then, and beg them to come to our aid?" asked Mr. Fenwick. "Even if they have had a fire, it is out now, and they ought to be glad to save life."

"They would come to our aid, or send," spoke Tom, "but I cannot make their wireless operator pick up our message. Either his apparatus is not in tune, or in accord with ours, or he is beyond our zone."

"But you heard him," insisted Mr. Damon.

"Yes, but sometimes it is easier to pick up messages than it is to send them. However, I will keep on trying."

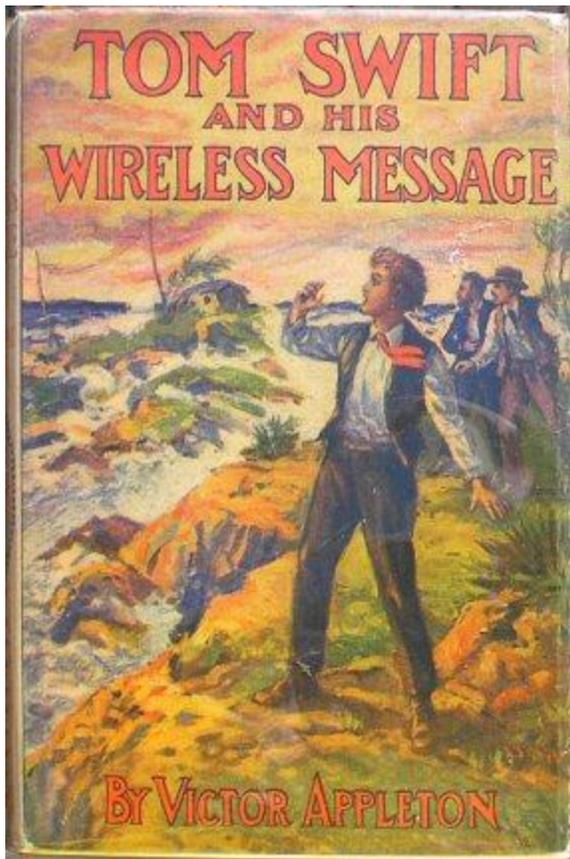
It's amazing how much technology has changed, isn't it? Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted. It also has helped me to grasp how far and how fast we have come. I wonder what people will be taking for granted 100 years from now...

#6. Tom Swift and His Wireless Message (1911) (Review 2)

or, The Castaways of Earthquake Island

Review by JP Karenko, May 2005

White Quad, Brown Quad, Duotone, and Full Color dustjacket images are from the collection of Mark Snyder



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

The book opens with Tom "adjusting" the motor of his new monoplane aeroplane, *Butterfly*. He gets a telegram from an airship builder in Philadelphia PA, one Hosmer Fenwick, and things immediately begin to go downhill for Our Hero. From here on in, a healthy dose of WSoD (Willing Suspension of Disbelief) is needed.

The coincidences in this story were too much to bear--I gave in to *The Urge*. Sorry...

Just sit right back and you'll read a tale,
A tale of a fateful trip
That started from a small air port,
Aboard a big airship.

Tom Swift was a mighty sailin' man,
A Skipper brave and sure,
Three Venturers set sail that day
For a three day-long tour.

(A three day-long tour.) [sound of thunder: crack!]

The weather started getting rough,
The big airship was tossed.
If not for the courage of the fearless crew,
The *Whizzer* would be lost.

(The *Whizzer* would be lost.)

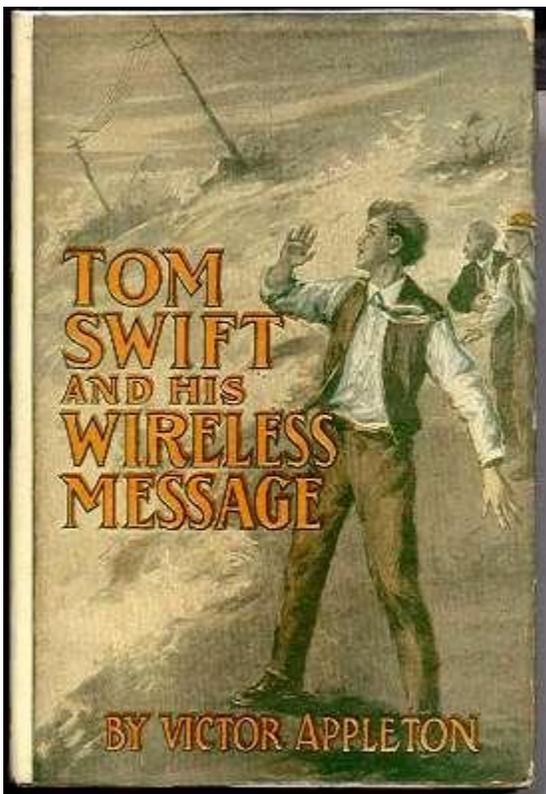
The ship's aground on the shore of this
Uncharted Indies Isle

With Dameon, and Fenwick too,
A Millionaire (but) not his wife,
No Movie Star, a Professor and Mary's Mam,
Here on Earth-quake Isle!

There's more, but the groaning is getting to me, so I think I'll stop, for now, with apologies to Gilligan & Company... In a nutshell, I just covered the 1st three-quarters of the book's plot, except for a couple of run-ins with a certain red-haired nasty by the name of Andy Foger, and the usual repartee with the other standard characters in the series. You'll have to read the rest of the story to see how Tom gets out of THIS one... (The title is a giveaway, though.)

Cast of Characters (More or less in order of appearance)

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. Is a decent cook, too.



Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro journeyman jack-of-all-trades. "Eradicates dirt." Lately, is working as a gardener, and seems to be getting into Bush-isms (as in George W.) Calls Mr. Wakefield Damon, Mr. Wakeful Lemon. Heavy deep-south accent and Uncle Remus attitude. Is described as "aged, slow and shuffling." Caretaker of **Boomerang**, a cantankerous aged mule.

Barton Swift--Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. In this episode, described as "aged" and "nervous" and slow moving.

Hosmer Fenwick--Philadelphia inventor, working on an electric airship. Requests Tom's aid to make his overweight and underpowered machine fly.

Garrett Jackson--Aged (65+ years old) "engineer" who seems more a handyman or machinist and watchman type than an engineer. Resides on Swift estate.

Miss Mary Nestor--Budding love interest who lives in neighboring town of Mansburg. Described as a "fair young woman with flashing brown eyes." Blushes easily, especially around Tom. In this tome, we find out *she can't cook*, (Watch out, Tom! She may have other nasty secrets) but plies him with apple turnovers made by her servant, Bridget. (See below.)

Mr. & Mrs. Amos Nestor--Mary's parents, off on a West Indies cruise, with a business associate. No descriptions given. Mrs. Nestor is a fine cook. Apparently has just neglected Mary's education.

Mr. George Hosbrook--Business associate of the Nestors. Millionaire owner of Motor Yacht *Resolute*. No description given

Mrs. Duy Puyster--NFN or description given, except "rich."

Miss Bridget--NLN or description given. Irish cook/servant hired by Mary Nestor.

Miss Sarah Malloy--No description given. Irish servant hired by local farm family.

Acquaintance and apparent rival of Bridget, (above.)

Andy Fogger--Red haired, squinty-eyed bully, who makes great trouble for Tom. "Poor little rich kid," son of wealthy family, born with a chip on his shoulder. Reckless, blustery and angry. Showoff. "Has money, and not much else." Lately has upped ante to breaking and entering at Swift shops. Severely vandalizes *Butterfly* as revenge for run-in with Tom.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. In this episode, he is found to be an old school chum of Mr. Fenwick and goes along for the ride in his new airship.

John Sharp--Professional balloonist and trapeze artist. Rescued by Tom when his hot-air balloon gets a bit *too* hot and burns. Deputy Sheriff as a sideline. Co-designer with Tom, of the Airship, *Red Cloud*. Tall, thin and 'dark' of complexion. "In residence" with the Swift family, has become sort of hands and feet for Tom's father. Passing mention in this volume.

Mrs. Baggert--Housekeeper. Kindly, and "loves Tom like a son." Employed by the Swift family since the time Tom's mother died. She is short of stature and has to stand on a soap box to kiss Tom goodbye on one of his voyages. Excitable, she seems to expect fatalities after any mishap involving Tom's inventions.

A Bevy of Bountiful Beauties--Female friends of Mary Nestor who are hanging out with her while Mary's mom & dad are away. No names or descriptions given, except for one **Mabel Jackson**, who seems to be prescient. She somewhat ominously predicts the events detailed in the last half of the book. (I wonder if she does Lottery numbers?)

Mrs. Fenwick and Mrs. Damon--NFNs or descriptions given, except that the castaways haven't seen trouble like they'll get at home after they are rescued from the island.

Castaways of Earthquake Island--9 survivors of the wreck of the *Resolute*: **Mr. & Mrs. Amos Nestor**, Mary's parents. **Captain Mentor**, skipper. **Jake Fordham**, ship's mate. **Mr. George Hosbrook**, Millionaire. **Mr. Ralph Parker**, Professor. (Any bells ringing, here, yet???) **Mr. & Mrs. Floyd Anderson**, and **Mr. Barcoe Jenks**, a nervous and mysterious character who being introduced here, and is a main character in the next book in the series, *Tom Swift Among the Diamond Makers*.

Captain Valasquez--Master of steamship *Cambaranian*. NFN or description given.

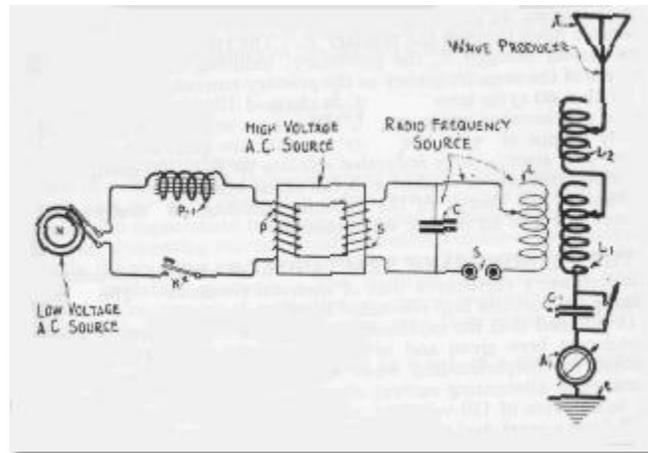
Major Inventions

Tom Swift does again invent something major in this book. Well, maybe, "invent" is too strong a descriptor--*The Butterfly* is a monoplane 2-seat aeroplane, powered by a 4-cylinder radial engine. It has under-cambered wings, canvas and wire construction and controls via warping surfaces. Undercarriage is tricycle tires. It is "modeled" (nearly identically) on the Bleriot monoplane, and the "invented" part seems to be Tom's inveterate ability to "improve" things mechanical, usually by changing gear ratios. How it was improved is not detailed except for it being a 2-seater and an obvious tricycle landing gear. The original had room for only a pilot and only 2 wheels. (See picture.) It was therefore prone to nose-over on landing. The little plane plays only the part of a transportation prop in the story. It is already fully built and developed at the start of this tome. Tom is a fast worker, as this tale falls only shortly after the end of the previous episode, the *Electric Runabout*. I suppose it's because he has a reputation as a miracle worker to maintain, kind of like *Star Trek's* Mr. Scott.



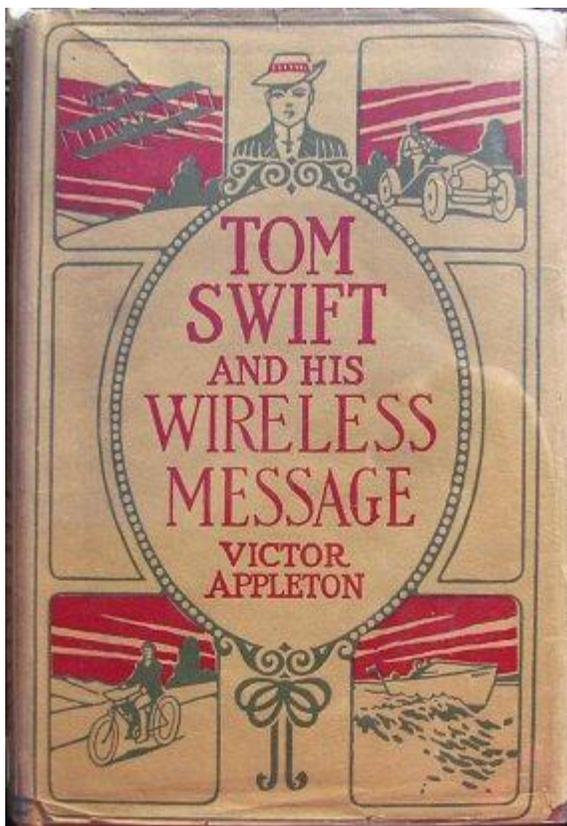
The main mechanical wonder in the first part of the story is the airship *Whizzer*. This is an overweight, underpowered gas bag/tri-plane · la *Red Cloud*, but larger. The innovation is that it uses a hybrid power plant consisting of a gas engine driving a dynamo driving twin electric motors, that are geared. It is well appointed and luxurious, which is part of what makes it hard to get off the ground. Improvements Tom makes are: a better (but unspecified) lifting gas, the gearing of the electric motors, (the props would have to be redesigned, too, but no mention was made of that) and numerous other un-detailed tweaks and changes.

The wireless Tom builds, from materials salvaged from the wreckage of *Whizzer*, is a spark-gap type with a claimed range of 1000 miles. Considering that a 1/2kW station of the day had a range of 100 miles, this was a real accomplishment. Seeing this rig was constructed from baling wire and chewing gum (so to speak) it would need much more power than any airship-ready dynamo could provide. (See Errata).



Typical Dynamo Powered Spark-Gap Radio Transmitter

Commentary on Society, Attitudes, Environment & Errata



It's amazing how much society and technology have changed in 95 years. Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted. It also gives me an appreciation as to how much society has changed, too. I wonder what people will be taking for granted 100 years from now, and what they will think of our times? I believe Robert Heinlein put it best when he described our current era as "The Crazy Years."

Attitudes and Prejudices: Philadelphia is repeatedly called the Quaker City, rather than the more current City of Brotherly Love. Philly has had several varied nicknames over the years. Fresh eggs are transported in sawdust, and canned foods are now "available in variety."

Mary Nestor being unable to cook is a surprise. I suppose that if her parents were wealthy, she might be an ornamental, but at least the women I knew personally from those times, now long passed away, all had basic survival skills and knew how to cook, clean, sew and keep house. It's also surprising that a common farmer of that time could afford to hire a cook/servant. Hired hands of the day were generally only hired if the farmer had no

sons, and then, paid in a share of the farm's output rather than cash money. Cash was scarce.

Errata: On p26 a farmer leaves his wife or (on) the seat of their wagon. On p46 Butterfly at 80mph is "faster than Red Cloud." R/C runs at 90mph, at the beginning of Submarine Boat. On p86 someone is "persuaded" rather than persuaded (The spell-checker is going nuts...)

Engineering and Science, Fact vs. Fantasy: The idea of taking an inefficient gas engine, connecting it to an inefficient electric dynamo through an inefficient mechanical coupling, and using the current generated to drive an inefficient geared electric motor, through hand carved propellers makes the power plant of the *Whizzer* a losing proposition. Period. Apparently the authors, desperate to get an electric powered aircraft into the story, never considered the cascade effect of all this heavy and inefficient machinery on the power-to-weight-ratio of a craft supposedly able to support itself on three small wings. I'm not sure even a miracle-worker like Tom could get this lead sled off the ground.

The base speed of the *Whizzer* was noted as a blistering 20mph. Not bad, I suppose, for something with the frontal area of a large hay barn. The top speed of the ship in the storm was 150mph. This would have torn the wings off even a military airplane in 1910. The explosion that was the beginning of the end of *Whizzer* did not seem to result in a fire. This was very unusual, since the lifting gas was probably Tom's highly volatile brew (See Book #3) Oh, they "vol-planed" to a landing...The authors were quite enamored of this term, apparently not realizing that to vol-plane (To *glide toward the earth with the engine cut off*), the engine(s) had to be stopped. (They were still running until Tom shut them off.) Also, you needed *planes* to *vol* with. The gas bag was in tatters and 2 of the 3 wings were smashed and dangling, limply. A duck carrying a load of birdshot would vol better than this turkey. I suspect the force of their return to Earth was highly understated.

The wireless rig described in the story could be built, with the proper materials & tools. Whether those would be available in the airship remains, is unlikely. The many yards of insulated copper wire and iron cores needed for transformers would not be found in a scrap airship. Even the aerial (antenna) wires, which would have to be many, many meters long, would be very hard if not impossible to splice adequately from stays and guy wires.

The 5 wire antenna would be, of necessity, directional, unless laid out in a star configuration. They'd need more than one dead palm tree to string cables from. Tom used the old Morse CQD (Come Quick, Danger) distress call rather than the newer SOS, to avoid confusion at the receiving end. This is legitimate. *Titanic* sent both calls out, while sinking, to cover all the bases.

Geography: Philadelphia, PA is said to be 250 miles from Shopton, a 5 hour journey, by train. A quick route calculation shows Lake George, NY as being almost exactly 250 miles from Philly. This could place Shopton on Lake George (Carlopa) instead of Lake Champlain, as I had concluded, earlier. Further support for the idea is that if Carlopa were Champlain, Shopton (on the east lake shore,) would be in Vermont. It is "located" in New York State.



West Indies Map

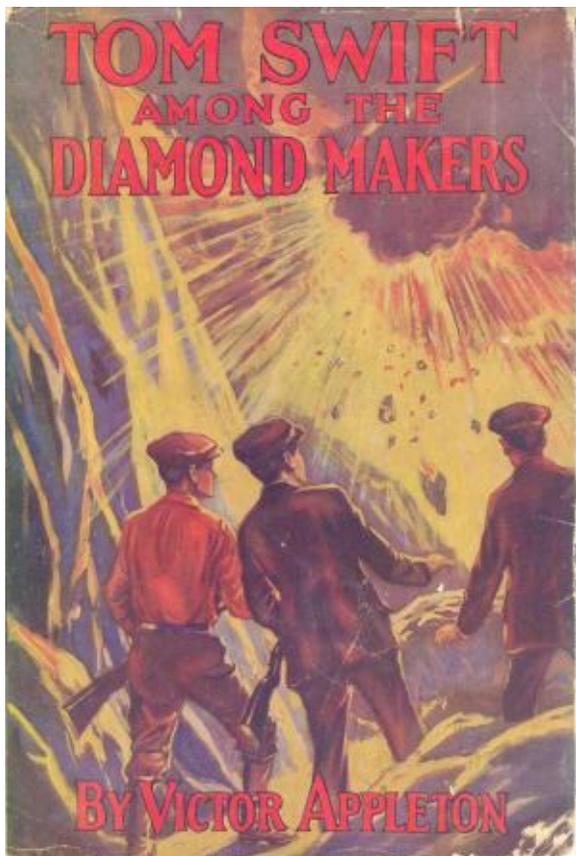
Earthquake Island is uncharted (aren't they all in these stories?) and is claimed to be volcanic with a rocky central spine. It is forested (it's been there a while) and has fresh water springs. The constant earth tremors are attributed to the foundations of the island being washed away by strong deep-ocean currents. In reality, the area is tectonically active and while earthquakes do occur, ocean currents washing the island away is highly unlikely. A more plausible disaster would be an eruption. Also, fresh water springs are far & few between that far from an aquifer. Rainwater runoff to a small stream is a more plausible source of fresh water.

JP Karenko 5/8/05

#7. Tom Swift Among the Diamond Makers (1911) (Review 1)

Or, The Secret of Phantom Mountain

White Quad, Brown Quad and Duotone images from the collection of Mark Snyder



Summary: No official summary was ever provided with any of the old Tom Swift books. However, the plot can be summed up as follows:

While young Tom Swift is in a jewelry store shopping for a ring for Mary, he meets a man who claims to be willing to teach Tom how to make diamonds. Later, the man (who happens to be one of the party that Tom rescued in the book *Tom Swift and his Wireless Message*) tells Tom his story -- how he was approached by a group of men who knew how to make diamonds, how he actually watched them make diamonds, and how he gave them some money, and how they dumped him (but not before giving him a fortune in diamonds). The man urges Tom to go with him on a hunt for these diamond makers.

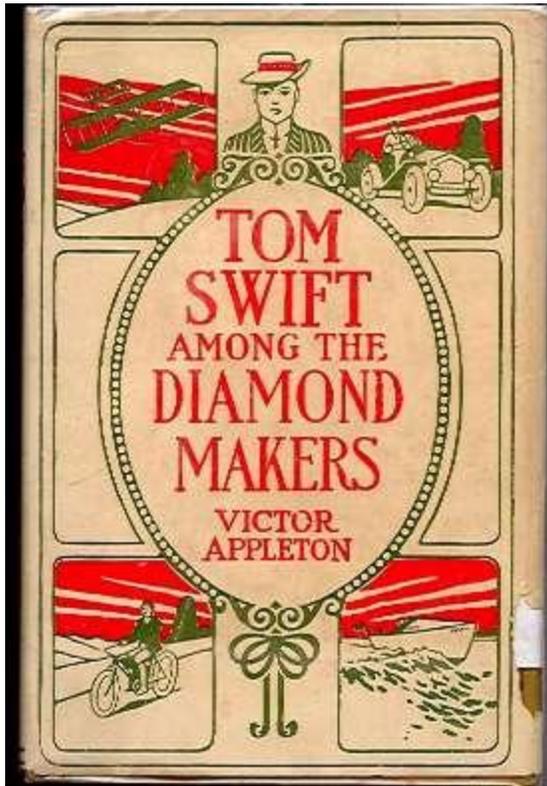
After some thought on the matter, Tom agrees to go after the diamond makers, taking with him Ned, Mr. Damon, and Mr. Parker (the doomsday-predicting scientist in *Tom Swift and his Wireless Message* who predicted the destruction of the island). After a long search and plenty of adventures along the way, the small band locates the diamond makers -- but is then captured.

Can they escape from Phantom Mountain? Can they learn the secret of the diamond makers? Will the mountain really be destroyed, as Mr. Parker predicted? It's all there, in *Tom Swift Among the Diamond Makers*.

Major Inventions

Tom Swift didn't invent anything in this book. He did use some of the things he invented in the past (such as his Airship), but he didn't invent anything new. However, that's not to say that there isn't an intriguing scientific concept here, because there is one -- in the process of diamond making.

Basically, the diamond makers harnessed the power of lightning to create diamonds. They set up base in a mountain loaded with iron that attracted a great deal of lightning. When any storms would come along the lightning would strike the mountain, creating enormous currents of heat and pressure that the diamond makers used on their carbon-chemical and thus create their diamonds with.



The basic idea behind all of this -- that is, that diamonds can be made by applying tremendous amounts of heat and pressure -- is very scientific. Today's scientists do indeed have the ability to make diamonds. The process is enormously expensive and yields only minute small diamonds, but it can indeed be done. There is even some talk about "growing" very, very, very small diamonds in a special diamond dust type mixture and coating glass and other substances with a diamond coating.

However, it's completely impossible for us to make large, jewel-quality diamonds on an economic basis. If it were, we would no longer go through the enormously expensive and tedious process of mining diamonds ourselves; we would simply manufacture them instead. The idea set forth on the book is an intriguing one. Why not harness the enormous power of lightning? It is a well-known scientific fact that lightning packs *enormous* quantities of raw electrical power. Why not let lightning do our work for us?

For that matter, why stop at using it to create diamonds? Why not set up pollution-free power stations to harness lightning to power cities? Lightning comes in vast quantities, is free, is enormously powerful, and does not deplete fossil fuels or the environment in any way. Why not tap this nearly unlimited natural resource of ours?

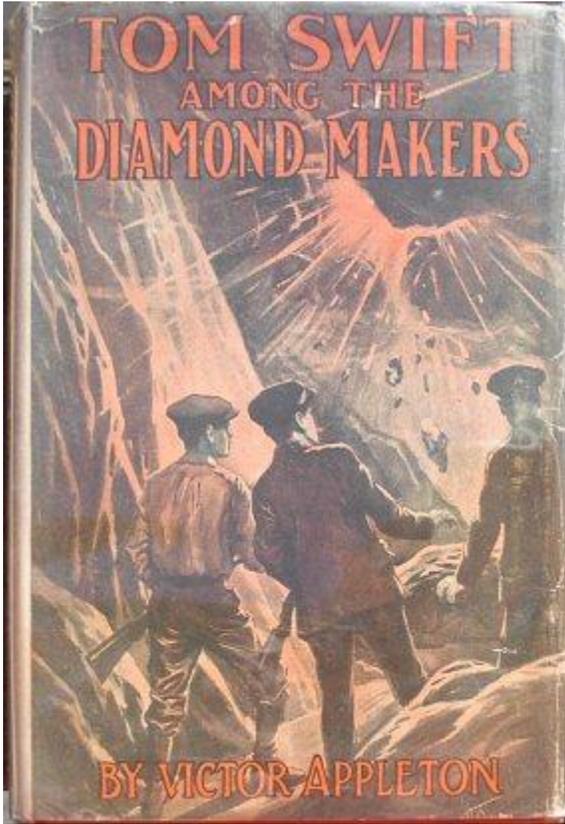
Simply because lightning is so powerful and uncontrollable. The idea is scientifically sound, but it is a bit unpractical. I haven't done any experiments to back this up with, but I'm reasonably sure that it would be a tremendous job to harness lightning. How could one possibly take a lightning bolt and purify it to the type of electricity you want? Maybe it could be done, but it would be an enormous job and would require years of work and research.

Still, it just might be worth it. Someone should look into this one of these days...

Here are some passages extracted from the book that talk about diamond making:

...The men were unaware of the presence of our friends, and were busily engaged. Some attended to the grinding machine, the roar and clatter of which made it possible for Tom and the others to talk and move about without being overheard. Into this machine certain ingredients were put, and they were then pulverized, and taken out in powdery form.

The power to run the mixing machine was a gasoline motor, which chug-chugged away in one corner of the cave.



As the powder was taken out, other men fashioned it into small balls, which were put on a pan, and into a sort of oven, that was heated by a gasoline stove.

"Is that how they make the diamonds?" asked Mr. Damon.

"That is evidently the first step," said Mr. Jenks. "Those balls of powdered chemicals are partly baked, and then they are put into the steel box. In some way terrific heat and pressure are applied, and the diamonds are made."

...

Suddenly there rushed into the cave a man who seemed much excited.

"Are you nearly ready with that stuff?" he cried. "There's a good storm gathering on the mountain!"

"Yes, we'll be ready in half an hour," answered one of the men at the mixing machine.

"Good. It will be flashing lightning bolts then, and we can see what luck we have. The last batch was a failure." The man hurried out again.

...

Eagerly the adventurers looked through the opening at the end of the passage into the larger cave. The men opened the small oven in which the balls of white chemicals and carbon mixed, had been baked, and a pile of things, that looked like irregularly shaped marbles, were placed in the steel box.

This box, which was about the size of a trunk, was of massive metal. It was placed in a recess in the solid rock, and all about were layers of asbestos and other substances that were non-conductors of heat.

...

"But, bless my watch-charm!" exclaimed Mr. Damon, "I didn't know lightning made diamonds."

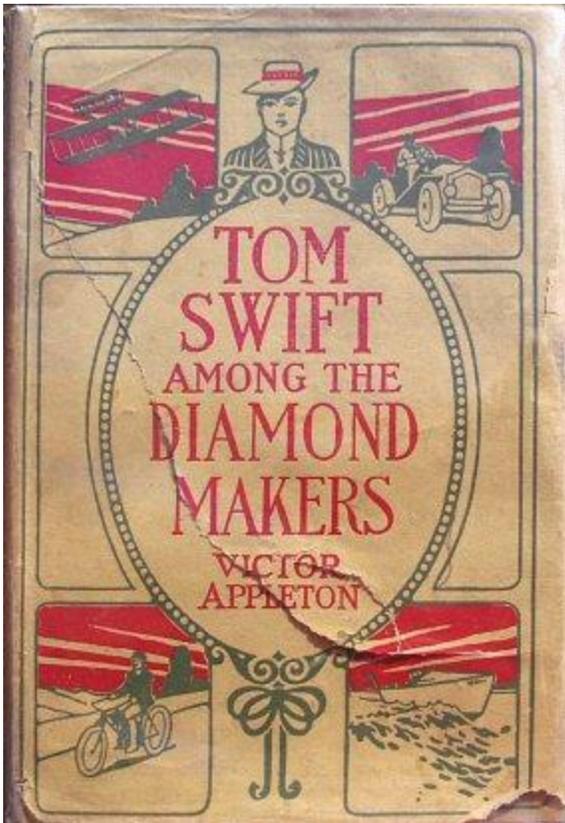
"It does not -- always," went on the scientist. "But great heat and pressure are necessary to create the gems. In nature this was probably obtained by prehistoric volcanic fires, and by the terrific pressure of immense rocks. It is possible to make diamonds in the laboratory of the chemist, but they are so minute as to be practically valueless."

"However, these men seem to have hit upon a new plan. They utilize the terrific heat of lightning, and the pressure that is instantaneously obtained when the bolt strikes. I am anxious to see how it is done. Look, I think they are getting ready to make the gems."

Indeed there seemed to be an air of expectancy among the diamond makers. The mixing machine had now been stopped, and, as it was quieter in the face, our friends, in their hiding-place, had to speak in mere whispers. All the men were now gathered about the great steel box.

This receptacle had been closed by a solid metal door, which was screwed and clamped tight. Then one of the men examined a number of heavily insulated electric wires that extended from the box off into the darkness where Tom and his companions could not discern them.

...



"Will the storm be severe enough?" asked one of the helpers. "We had all our work for nothing last time. The flashes weren't heavy enough."

"These will be," asserted Folwell. "The indicator shows nearly a million volts now, and it's increasing."

"A million volts!" exclaimed Tom. "I hope it doesn't strike anywhere around here."

"Oh, it will probably be harmlessly conducted down on the heavy wire," said Mr. Parker. "We are in no danger, at present, though ultimately I expect to see the whole mountain shattered by a lightning bolt."

"Cheerful prospect," murmured Tom.

There was a terrific crash outside. The rocky floor of the cave trembled.

"Here she comes!" cried Folwell. "Get back, everybody! I'm going to throw over the switch now!"

The men retreated well away from the steel box. Folwell threw over the lever--the same one Mr. Jenks remembered pulling. Then the man ran to the electric switch on the wall, and snapped that into place, establishing a connection.

There was a moment's pause, as Folwell ran to join the others in their place of safety. Then from without there came a most nerve-racking and terrifying crash. It seemed as if the very mountain would be rent into fragments.

Watching with eager eyes, the adventurers saw sparks flash from the steel box. Instantly it became red hot, and then glowed white and incandescent. It was almost at the melting point.

Then came comparative quiet, as the echoes of the thunder died away amid the mountain peaks.

"I guess that did the trick!" cried Folwell. "It was a terrific crash all right!"

He and the others ran forward. The steel box was now a cherry red, for it was cooling. Folwell threw back the lever, and another man disconnected the switch. There was a period of waiting until the box was cool enough to open. Then the heavy door was swung back.

With a long iron rod Folwell drew something from the retort. It was the tray that had held the white balls. But they were white no longer, for they had been turned into diamonds. From their hiding-place Tom and the others could see the flashing gems, for, in spite of the fact the diamonds were uncut, some of them sparkled most brilliantly, due to the peculiar manner in which they were made.

...

"That's going some!" exclaimed the chief of the diamond makers. "We have a small fortune here."

#7. Tom Swift Among the Diamond Makers (1911) (Review 2)

or, The Secret of Phantom Mountain

Review by JP Karenko, May 2005

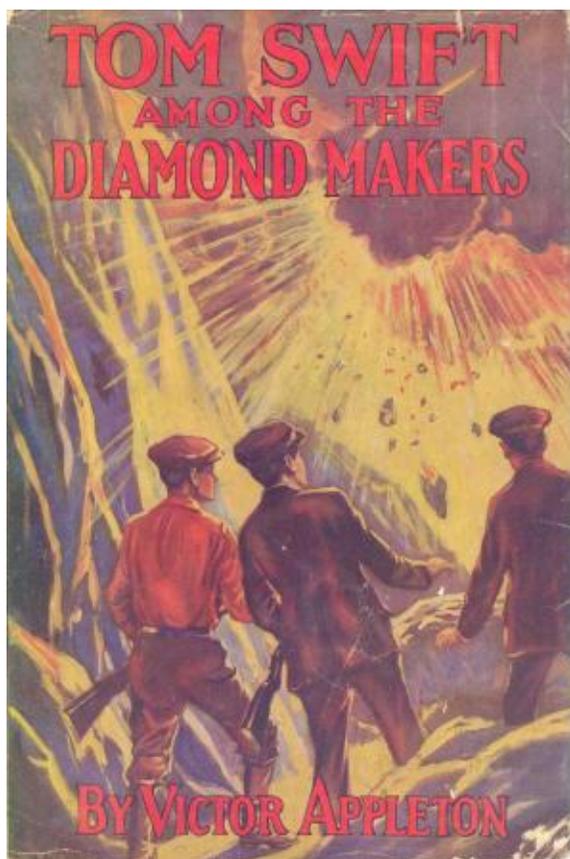
White Quad, Brown Quad and Duotone images from the collection of Mark Snyder

Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

The story opens with Tom shopping for a diamond brooch at a jewelry store in the city of Chester, 50 miles from Shopton. Barcoe Jenks, the nervous and eccentric financier introduced on Earthquake Island, shows up, having been followed by sinister and threatening members of *The Diamond Makers*. He enlists Tom's aid to travel to Colorado and determine the method of making artificial but perfect gemstones. The secret of this process was used as bait to defraud Jenks of a large sum of money by the bad guys.

Sinister plots are afoot. Our hero, is accompanied by Jenks, "de blessing man," Mr. Damon and Mr. Parker, the doom & gloom scientist from Earthquake Island. They set off for the Rockies in Tom's ever more luxurious dirigible/biplane airship, the *Red Cloud*.

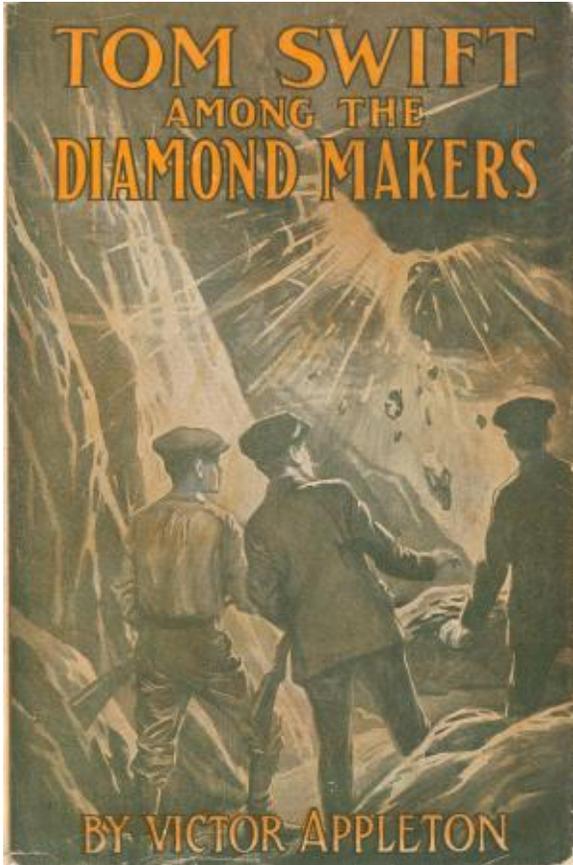
How they escape from captivity on Phantom Mountain, the clutches of The Diamond Makers, and the fury of Mother Nature, is something you will have to read the book to ascertain.



Cast of Characters (More or less in order of appearance)

Mr. Track--NFN or description given. Proprietor of a small jewelry store in the city of Chester, NY.

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Et cetera...In this tome, shows an increasing interest in Miss Mary Nestor, for whom he is now buying diamond jewelry.



Mr. Barcoe Jenks--A nervous and mysterious character, introduced in *Wireless Message*. Claims to know how to make gem-quality diamonds. Enlists Tom's aid to recover his rights" from bad guys.

Enos Folwell--Leader of the *Diamond Makers Gang* (DMG). Scruffy, stumblebum appearance.

The Shadowy Stranger, (Farley Munson)--No description, except "dangerous." Muscle for DMG.

Eradicate (Andrew Jackson Abraham Lincoln) Sampson, A.K.A. Eradicate or Rad--Aged stereotypical Negro journeyman jack--of--all--trades. "Eradicates dirt." Lately, is in residence on the Swift estate. Heavy deep--south accent and Uncle Remus attitude. Caretaker of **Boomerang**, a cantankerous aged mule.

Garrett Jackson--Aged (65+ years old) "engineer" who is more a handyman/machinist and watchman type than engineer. Resides on Swift estate.

Barton Swift--Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. In this episode, described as "aged" and "nervous," he plays only a passing role.

Andy Foger--Red haired, squinty--eyed bully, who makes great trouble for Tom. "Poor little rich kid," son of wealthy family, born with a chip on his shoulder. Reckless, blustery and angry. Showoff. "Has money, and not much else." Lately, resides in Chester, where Tom is doing business. No real part in this story.

Mr. Roberts--NFN or description given. Proprietor of a large jewelry store in the city of Chester.

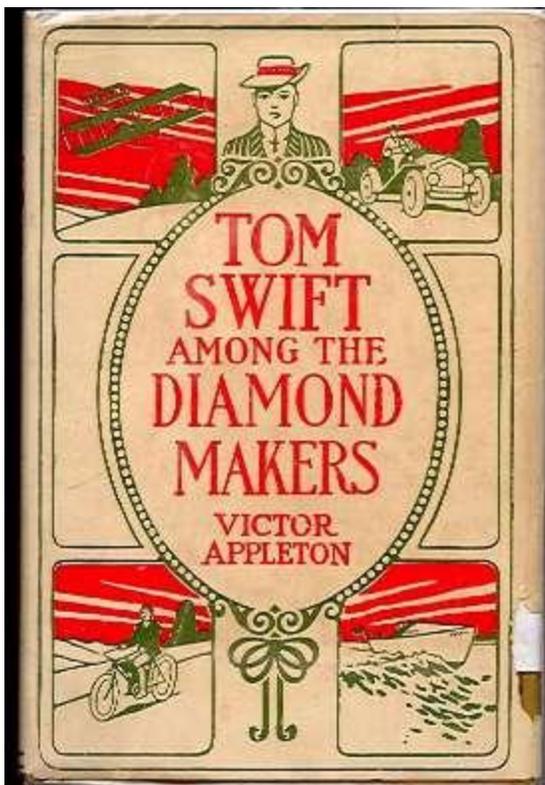
Mr. Porter--NFN or description given. Gemologist employed by Mr. Roberts, above.



Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. In this episode, he has lost weight, has become fit and is spry enough to go stomping up mountainsides in Colorado. Previously described as "too stout to run" and constantly suffering various medical ailments. Doesn't seem bothered by Colorado Mountain altitude.

Mr. Ralph Parker--Gloomy scientist, introduced in *Wireless Message*. Friend of Wakefield Damon. Constantly predicts disasters of various kinds. Is able to find a dark lining in any silver cloud. In this tome, predicts landslides and the destruction of Phantom Mountain. Reminiscent of a certain fellow named "Joe," from L'il Abner. (See illustration.)

Miss Mary Nestor--Love interest of Our Hero. Now, the recipient of "frequent visits" from Tom. (--and diamond jewelry. Things are getting serious, folks.)



Bill Slatterly--Colorado miner noted for a loud mouth.

Jed Nugg--Colorado miner noted for being elderly, quiet, and sleeping a lot.

The Phantom of the Mountain, (Bill Renshaw)--Repentant ex-cohort of DMG. He is the "phantom" of "Phantom" Mountain. Wears a ghost costume to scare trespassers away. Becomes friend and rescuer of Tom & company, after they are captured by bad-guys.

Pair of DMG Guards--Accost & threaten Tom and Co. No descriptions or names given.

Assorted DMG Members--No descriptions or names given, except more than two. All are nefarious to malevolent in attitude.

Abe Abercrombie--Grizzled and rough Colorado miner. Needs Toms help to make the next story in the series possible. Shows up, literally at the last minute, in the story.

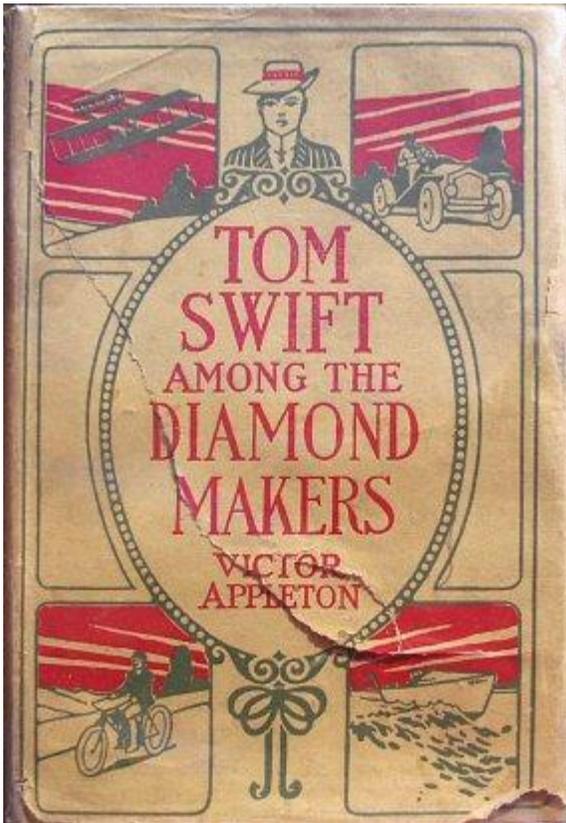
Major Inventions

Tom Swift didn't invent anything even minor in this book. The diamond making process, however was of great interest to him, and represented some nearly plausible technology. See Engineering and Science, Fact vs. Fantasy, below.

Commentary on Society, Attitudes, Environment & Errata

It's amazing how much society and technology have changed in 95 years. Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted, (like GPS.) It also gives me an appreciation as to how much society has changed, too. I wonder what people will be taking for granted 100 years from now, and what they will think of our times? I believe Robert Heinlein put it best when he described this era as "The Crazy Years."

Attitudes, Prejudices and Circumstances: Language usage was interesting at times. Tom and his associates go armed with rifles, shotguns and revolvers, but these do not seem to deter anyone. Bad guys ignore them and good guys charge the armed Bill Renshaw (at the time, thought to be a bad guy) with no concern for personal safety. Rad was not referred-to with the usual demeaning terms that today are considered racial slurs. The writing style is enough different, that this author may have been one of the ghost (Phantom?) writers that took over from the originator of the series, Edward Stratemeyer. Howard Garis is credited as author of all 35 original books, but writing style has changed enough on several occasions to make one wonder.



Errata & Inconsistencies: Only a few typos were noted. On p87 Mr. Parker wish (ed) The tense was wrong. On p147 ...and instant later should be "an." On p158 Tom relpys instead of reply-ing John Sharp, a pivotal character in several previous books has dropped off the face of the Earth. No explanation was given for his conspicuous absence. The Red Cloud (RC) now will accommodate 10 and has a dining room and storage room(s). In the original story, it carries 5 and the galley/eating area was part of the main cabin. Stores were kept near the mechanical equipment. This monster air-yacht seems to become ever-more capable and luxurious, while shrinking in size. RC is described as "small enough to hide in a grove of trees." You could hide an elephant in a tree, more easily, but

you'd have to paint his toenails red... (Ask any 3rd grader if you don't get the previous reference.) See also, my analysis of RC's size in the review of Tom Swift in the Caves of Ice. Phantom Mountain's caves are warm enough to make note of. Most caverns of any depth have an ambient temperature of about 50F. Warmer temps only occur as you get very deep.

Engineering and Science, Fact vs. Fantasy: In this volume, the scientific and geologic knowledge of the author(s) was again tested. Diamond making is described as a multi-step process, involving extensive milling/grinding of ingredients, pressing those ingredients into a pre-form, and baking or sintering them. The resultant pellets were then exposed to great pressure, heat and massive jolts of celestial voltage. The

process sounds plausible, except for the final stage. Also missing would be multiple purification stages needed for the materials. Gem grade diamond is "pure" carbon with trace impurities that give it (usually unwanted) colors. Many forged powder-metal parts are made, today, by a similar process, sans the lightning, of course.

Speaking of lightning, this is where the authors really ran out of steam. Being on or in a mountain/cave anywhere near lightning, especially the: "terrific" type described, would be an invitation to become a crispy critter. Standing on dry ground (as opposed to rain-dampened) with or without the presence of iron ore, is likely to result in a more than just hair-raising experience. You also don't "outrun" something traveling at near light speed. In a real universe, Tom and his cohorts would still be on Phantom Mountain--or at least their bones would be. Finally, it would take some bolt to bring down a mountainside and collapse a cave complex as large as was described in the story.

Geography & Environment: Chester is a city 50 miles from Shopton in an unspecified direction. Leadville and Indian Ridge are towns listed on the route to Phantom Mountain, as are Black Gulch and Silver Trail. No descriptions, directions or distances are given for any of these places. Colorado has many iron deposits, so that part of the story is accurate. It also has many caves, some very large. The caves described in the story are not typical, with smooth floors and regular walls. Nor do large or deep caves usually occur high up inside an igneous rock mountain top. The passages described in the story would be more believable if identified as mine shafts or tunnels.

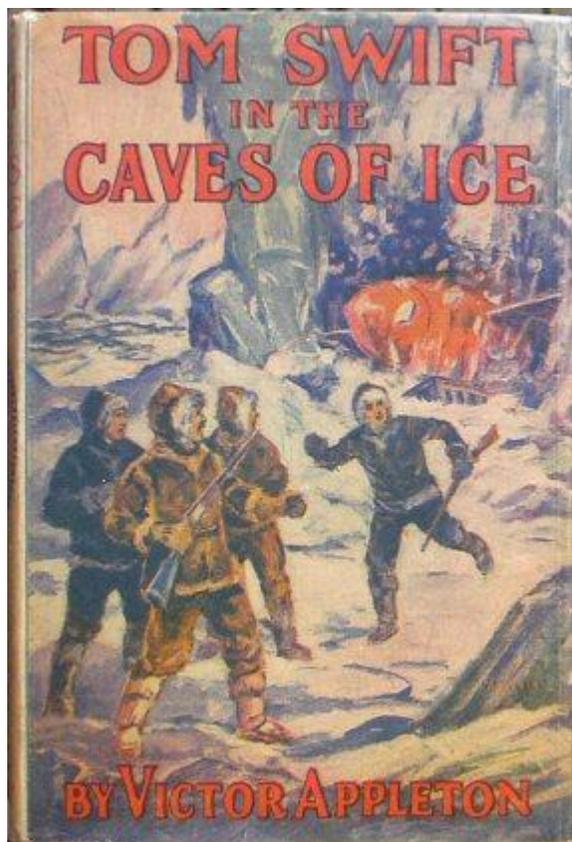
JP Karenko 5/20/05

#8. Tom Swift In The Caves of Ice (1911)

or, The Wreck of the Airship, Red Cloud

Review by JP Karenko, May 2005

Dustjacket images from the collection of Mark Snyder



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

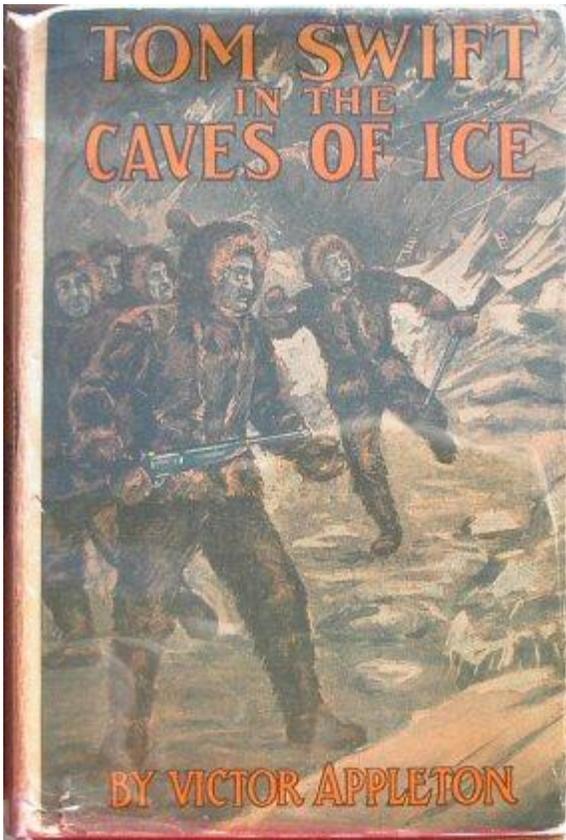
The story opens with Tom taking Eradicate, his Negro handyman, for his first aeroplane ride in the *Butterfly*. Rad is frightened nearly to death, and Tom does not help things by doing aerobatics "to help him get used to flying." When the engine quits and they have to vol-plane (glide) back to earth, Rad is ready to bail out without a parachute. Tom has to physically restrain him, or he would fall to his death. Once safely back on *terra firma*, poor Rad seeks solace and comfort in the stable, with his cantankerous, but faithful mule, Boomerang.

Abe Abercrombie, a Colorado miner introduced in the previous volume, *Tom Swift Among the Diamond Makers*, shows up with a tale of a "valley of gold" in the far northern reaches of Alaska. Andy Foger, the series' generic nemesis, learns of the place by stealing and copying Abe's treasure map. Andy is constructing his own airship, a large tri-plane. A race ensues to get to the valley and collect as much gold as is possible before winter storms make travel impossible and survival unlikely.

Hazards abound from the environment and from savages, both the civilized variety and others. The story ends in near-tragedy, but you will have to read it to find out the details.

Cast of Characters (More or less in order of appearance)

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. Is a decent cook, too. In this tome, shows an uncharacteristic streak of sadism, by laughing at the discomfort of his handyman, Rad. (See below.)



Eradicate (Andrew Jackson Abraham Lincoln) Sampson, A.K.A. Eradicate or Rad--Aged stereotypical Negro journeyman jack-of-all-trades. "Eradicates dirt." Lately, is in residence on the Swift estate. Heavy deep-south accent and Uncle Remus attitude. Caretaker of **Boomerang**, a cantankerous aged mule. Gets his first (and maybe, last) aeroplane ride with Tom.

Mrs. Baggert--Housekeeper. Kindly, and "loves Tom like a son." Employed by the Swift family since the time Tom's mother died. She is short of stature and has to stand on a soap box to kiss Tom goodbye on one of his voyages. Excitable, she seems to expect fatalities after any mishap involving Tom's inventions.

Abe Abercrombie--Grizzled and rough Colorado miner, introduced in the *Diamond Makers* episode.

Ned Newton--Chum & companion of Tom, currently employed in Shopton 1st National Bank as a newly promoted assistant cashier. This is his first extended adventure with Tom.

Jake Porter--No description given. Friend of Ned Newton. Passing mention.

Andy Foger--Red haired, squinty-eyed bully, who makes great trouble for Tom. "Poor little rich kid," son of wealthy family, born with a chip on his shoulder. Reckless, blustery and angry. Showoff. "Has money, and not much else." Lately has upped ante by announcing he will threaten Tom with a gun.

Sam Snedecker--Willing cohort of Andy Foger. No description given in this tome. Previously described as having "large ears."

Pete Bailey--Cohort and willing minion of Andy Foger. No description given. Generic bad guy.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person.

Mr. (Ralph) Parker--Gloomy scientist, who now resides in Waterford, near Mr. Damon. (See Errata.). Constantly predicts disasters of various kinds. Able to find the dark lining in any silver cloud.

Mr. Fogger--NFN given. Said to be in financial difficulty, due to bank manipulation schemes in previous volumes.

Barton Swift--Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. In this episode, described as "aged" and "nervous." In this tome, he plays only a passing role

Garrett Jackson--Aged (65+ years old) "engineer" who is more a handyman/machinist and watchman type than engineer. Resides on Swift estate.

Jim Mace--Partner of Abe Abercrombie. No description given. Passing mention.

Ned Newton's Parents--NFN's or descriptions given. Passing mention.

Simpson & Henderson--Machinists hired by Foggers to build and pilot their tri-plane. Airship.

Miss Mary Nestor--Love interest of Our Hero. Now the recipient of "frequent visits" from Tom.

Arthur Norton--Acquaintance of Swifts. No description given. Passing mention.

Sporty Stranger With Black Moustache--No other description given. Tries to steal Abe's map and vandalizes *Red Cloud*. May possibly be Anson Morse, due to the description given. (Morse is a bad-guy from previous tomes.) In the employ of Fogger family.

Pair of Street Thugs--Accost, beat and try to rob Tom. No descriptions given. Seem better educated than NY crooks, as they speak better English.

Pair of Seattle Police--No descriptions given, except "burly." One is named Mike. Passing mention.

Assorted Native Indians and Eskimos--Some good, some bad. Only distinguishable to Abe and Tom.

Major Inventions

Tom Swift sort-of invents something major in this book. Except for an "improved lifting gas," unspecified modifications are made to the *Red Cloud*, to make it more suitable for cold-weather travel. At a minimum, extra insulation around the cabin, and electric heaters for engine lubricants and the gas generator would be needed. Whatever changes were made did not require significant effort or time, at least as far as the story timing went.

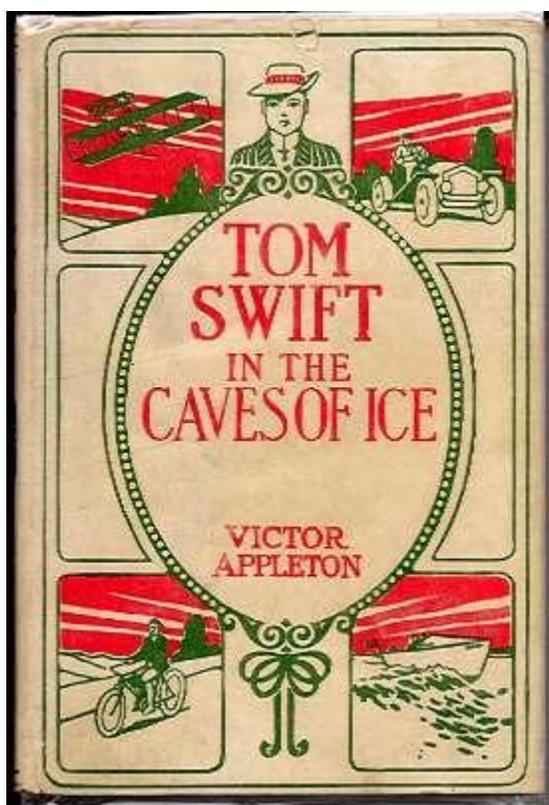
The *Electric Rifle* is introduced. The device, which plays a central role two volumes in the future of the series, is described as incomplete, but functions well enough to serve Tom in killing dangerous game and wounding attacking savages. The rifle sends out a silent packet charge (of plasma?) that can be regulated

from "stun" to "kill." This may have been the forerunner of the SciFi stunners and blasters used in many other adventure stories, all the way up to today's *Star Trek* Phaser.

I imagine the anti-gun folks down in Washington would be tripping all over themselves to ban this high-tech "assault rifle" even before the ink was dry on the patent.

Commentary on Society, Attitudes, Environment & Errata

It's amazing how much society and technology have changed in 95 years. Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted, (like GPS.) It also gives me an appreciation as to how much society has changed, too. I wonder what people will be taking for granted 100 years from now, and what they will think of our times? I believe Robert Heinlein put it best when he described this era as "The Crazy Years."



Attitudes, Prejudices and Circumstances: Language usage is interesting at times. "A cat may look at a King" was quoted. Superstitions regarding bad luck, such as "13 at a table" or "looking at the moon over the wrong shoulder" were quoted. Fountain pens were the order of the day. Mr. Damon blesses his "liver-pin, which turns out to be: liver-pin n. "the instrument which, by way of jocular hypothesis, is said to support, sustain, fasten, or secure the human liver" (Northall, 1896). Moving vans, at least in Shopton, are horse-drawn. Tom "doesn't believe in sneaking (spying)," but does so anyway--on Andy Foger. Andy threatens Tom with a gun, once again upping the ante on the discord between them. Rad refers to his brethren as "stuck-up darkies and coons." Eskimos and (non-Eskimo?) Indian tribes were called "savages," "brown-skinned beggars," "lazy," and "bad lot." Police Are referred-to as "bluecoats" and now (at least in Seattle) go armed. "Pinging" the ground with a nightstick and firing a revolver into the air are both accepted police tactics.

Shades of Fearless Fosdick...

Errata: Only a few typos were noted. On p3, someone is "persuaded." On p4, gasoline is now spelled in the modern form. It had been "gasolene." On p97. "both" Tom should be but Tom. Inconsistencies that were noted were on the following pages: Mr. Damon, who has been residing in both Waterford and Waterfield, NY, (at the whim of the author,) now resides in both--on the same page (p1.) Mr. Parker resides near Mr Damon, in Waterford, this time. The authors had some trouble with cartography. The Arctic Circle lies 900+ miles due north of Sitka, in Yukon Territory, Canada. In the story, it was reached

after traveling only 750 miles north-west. If the Valley of Gold (VoG) was reached after only 750 miles travel, it would be in the vicinity of Mt. McKinley or Fairbanks, a good 300mi south of the Circle.



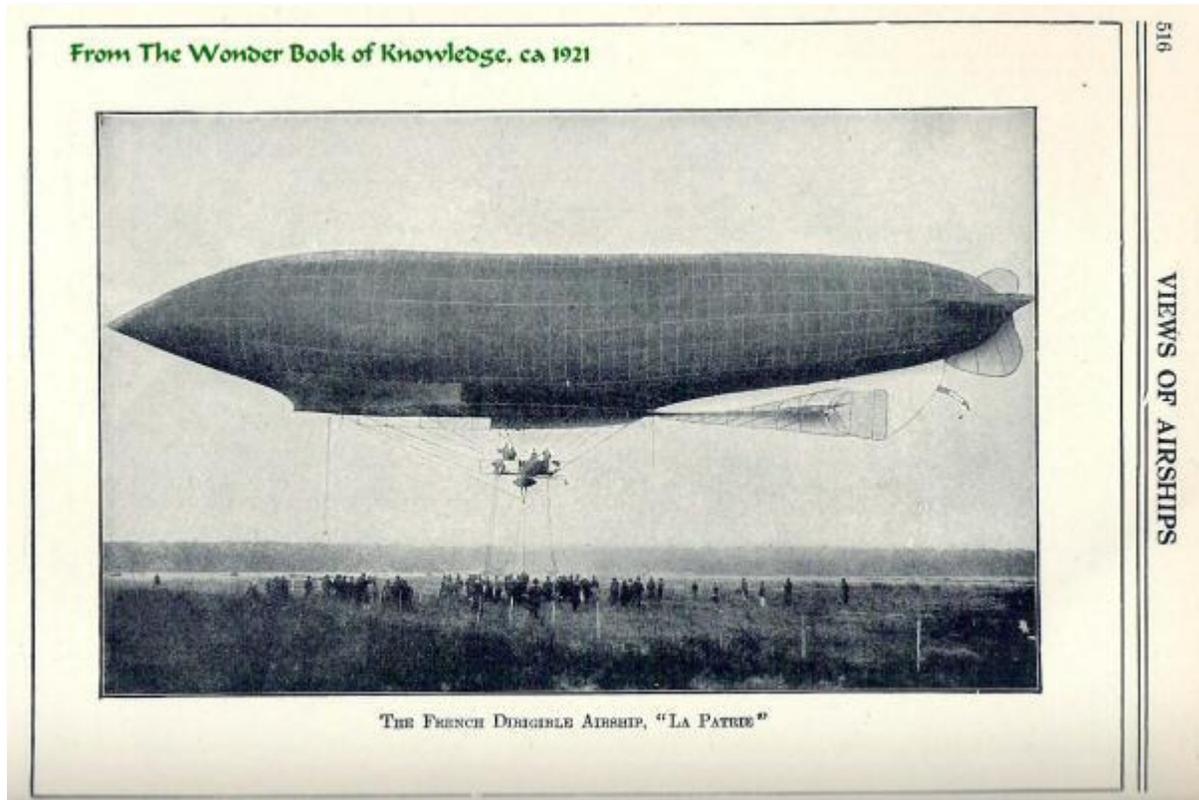
Alaska Map courtesy of Microsoft MapPoint

Hail the size of baseballs brings the *Red Cloud* to grief, presumably near Mt. McKinley. A check of NOAA's National Climatic Data Center shows **no** storms involving *hail of any size* in the central or arctic regions of Alaska from 1950 thru current day. It seems to be just plain too cold for thunderstorms, the primary hail-maker. I'd believe sleet, but even then, this was early winter and I'd expect snow, not the wetter stuff. The "gas bag" on *Red Cloud* started out as rigid Aluminum, painted red (how the airship got her name.) Now it appears to be fabric, needing repair after the abovementioned storm. The author(s) still haven't figured out that to **vol-plane** (glide) you need functioning *planes*. Andy Foger's airship the *Anthony*, loses 2 of its 3 wings due to structural failure, but is said to land safely. Yeh, like a falling brick! Also, the *Anthony* was supposed to be named after Andy. I always thought Andy was short for Andrew.

Engineering and Science, Fact vs. Fantasy: In this volume, it is apparent that the scientific and geologic knowledge of the author(s) was again tested. The fabulous ice caves seem to be standalone igloo-shaped domes that simply show up on a valley floor. These range in size from "small" to "large enough to

hold a craft *twice the size of Red Cloud*." No measurements for the R/C were ever mentioned, except "large." A shed to house it was "easily constructed" on the Swift Estate, and it was "hidden easily in a grove of trees," in *Diamond Makers*. The Book's dust jacket illustration of *Red Cloud* was given a quick scaling. Based on a 75 foot clock tower (7 stories plus roof) it is estimated that the R/C would be 60ft tall, 120ft long (including tail rudder) and 240ft span across the top wing. By contrast, the French airship *La Patrie*, a simple dirigible without the wings or luxury accommodations carried by *Red Cloud*, was 60ft tall by 240ft long. These caves would be truly remarkable structures if they could house an airship with twice the span of the *Red Cloud*. (480ft plus clearance.)

If such existed, they would be a true Wonder of Nature, even today.



Geography & Environment: To their credit, at least the authors got the gold part right. There *is* gold in them thar hills, but I'm not sure if it was just laying around, waiting to be picked up, as is described. Also starting this trip as winter is setting in would have been suicidal. By November, about half of the daily mean temperatures (arctic zone) are either zero or below. Without the modifying effect of the ocean, the long Arctic night temperatures of the interior drop to extreme low readings. Snow covers the ground about two-thirds of the year, and usually falls every month. Not a place I'd want to be, even in a "snug" airship. Working outside? Brrr!

Navigation, especially during storm season, would be difficult-to-impossible, especially when done by mere compass and landmark recognition. No one in the story had ever seen any landmarks, except Abe, and he had never seen them from the air. Things look different from an altitude of 2 miles.

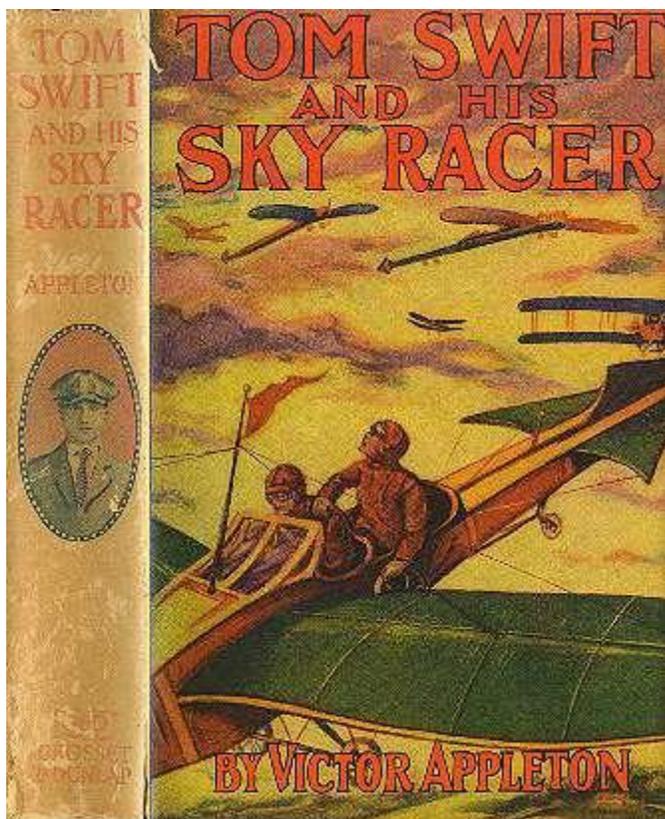
JP Karenko 5/20/05

#9. Tom Swift and His Sky Racer (1911)

or, The Speediest Flight On Record

Review by JP Karenko, May 2005

White and Brown Quad dustjacket images are from the collection of Mark Snyder



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

The story opens with Tom once again considering racing for money (something he said was a bad thing in an earlier volume.) The Eagle Park Aviation Association has scheduled an air race with a prize of \$10,000 and Tom feels obliged to win it by custom designing and building a "speedy" 2-seat monoplane. The craft is lightweight, small in size, and fast, which is unusual for aircraft of the day. The plans for the prototype go missing after prowlers are spotted and these indignities, plus an assault on Tom, a fire, and overwork all combine to cause Tom's father to have what is presumed to be a heart attack.

Winning mere prize money takes a back seat to Tom's *Humming-bird* being used to summon medical help for his father, who is imminent

danger of dying without the ministrations of a famous, but distant surgeon.

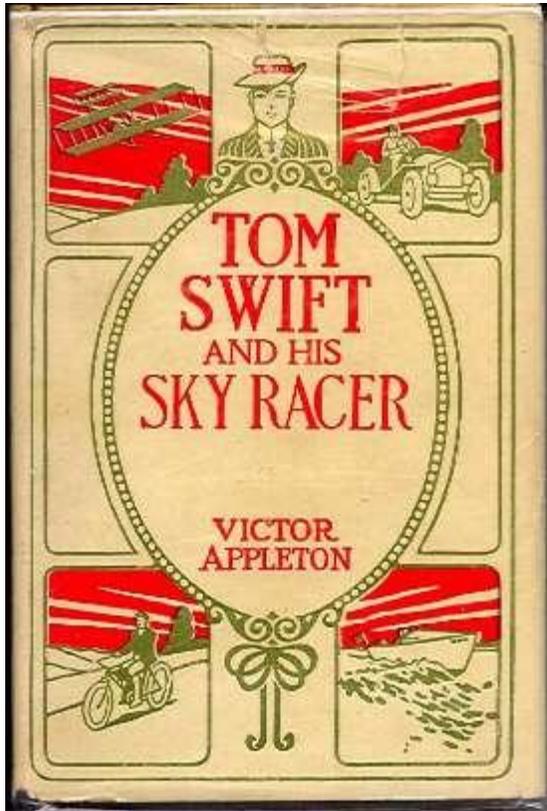
Who is responsible for the purloined plans, is a surprise twist at the end of the story.

You can probably guess the outcome, but you'll have to read the story to be sure.

Cast of Characters (More or less in order of appearance)

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home--schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. Is a decent cook, too.

Mr. James Gunmore--Representative of Eagle Park Aviation Association of Westville, NY.



Barton Swift--Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. In this episode, develops severe medical condition affecting his heart and circulation. Spends a lot of time being unconscious and causing Tom worry over his health and longevity.

Andy Foger--Red haired, squinty--eyed bully, who makes great trouble for Tom. "Poor little rich kid," son of wealthy family, born with a chip on his shoulder. Reckless, blustery and angry. Showoff. "Has money, and not much else." Lately is caught spying, burgles the plans for Tom's new *Sky Racer*., and is suspected of inventing dive bombing, when Tom's airplane hangar is set afire by a midnight air-raid.

Eradicate Sampson, A.K.A. Eradicate or Rad--Rad's middle names, (Andrew Jackson Abraham Lincoln,) are no longer used. Aged stereotypical Negro journeyman jack--of--all--trades. "Eradicates dirt." Now is in full-time residence on the Swift estate, and maintains his own chicken coop. Heavy deep--south accent and Uncle Remus attitude. Caretaker of **Boomerang**, a cantankerous, aged and now ailing, mule.

Mrs. Baggert--Housekeeper. Kindly, and "loves Tom like a son." Employed by the Swift family since the time Tom's mother died. She is short of stature and has to stand on a soap box to kiss Tom goodbye on one of his voyages. Excitable, she seems to expect fatalities after any mishap involving Tom's inventions. In this tome, she is described as "buxom." (Hey. Guys! This is a kid's series, remember?)

Garrett Jackson--Aged (65+ years old) "engineer" who is more a handyman/machinist and watchman type than engineer. Resides on Swift estate, now in an "apartment" inside the Swift home.

Dr. Gladby--Local medical maven, who makes repeated house calls to treat the ailing Barton.

Ned Newton--Chum & companion of Tom, currently employed in Shopton 1st National Bank.

Sam Snedecker--Willing cohort of Andy Foger. No description given in this tome. Previously described as having "large ears." Passing mention only, in this story.

Pete Bailey--Cohort and willing minion of Andy Foger. No description given. Generic bad guy. Passing mention only, in this story.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. Goes undercover as a spy on the Fogers to see if they have Tom's aeroplane design.

Miss Mary Nestor--Love interest of Our Hero. Now the recipient of "frequent visits" from Tom. Gets her first introduction to air-travel in Tom's new creation. It's love at first flight...

The Midnight Intruder--Hatchet-man (literally) who tries to destroy the *Humming-Bird*.

Dr. Kurtz--Blustery German physician brought in to minister to Barton Swift when Dr. Gladby is out of town. Has the same demeanor & heavy Bavarian accent as Police Inspector Kemp in *Young Frankenstein*.

John Sharp--Reappears as representative of Eagle Park Aviation Association, the host organization of the big air race. Tom does not recognize him without his moustache.

Mr. Bentley--NFN or description given. Uncle of Andy Foger. Lives in Hampton, NY, where the Foger Aeroplane is being constructed.

Jake--NLN or description given. Cohort of Andy Foger. Suspected to be Midnight Intruder (above.)

The Aerial Arsonists--Dive-bomb and set afire the shed where *Humming-Bird* is stored, in a midnight air-raid. Suspected to be Andy and Jake, but insufficient evidence to prosecute, as Tom only saw the pilot.

Dr. Edward Hendrix--Famous surgeon and specialist called upon to operate on Barton Swift. Lives in Kirkville, NY. Out in the boondocks, 100 miles from Shopton and presumably the nearest medical center, Tom has to airlift him in, as the only railroad bridge over "a broad river" is out.

The Trusted Nurse--No name or description given. Apparently true then, as it is today, doctors get all the fame, glory and money, while nurses get to do the dirty work and get no recognition.

Frank Forker--No description. A trusted Eagle Park machinist and mechanic, helps Tom assemble *Humming-Bird* for the big race.

The French Air Racer--Perique. No description.

The Dutch Air Racer--De Tromp. Ponderous.

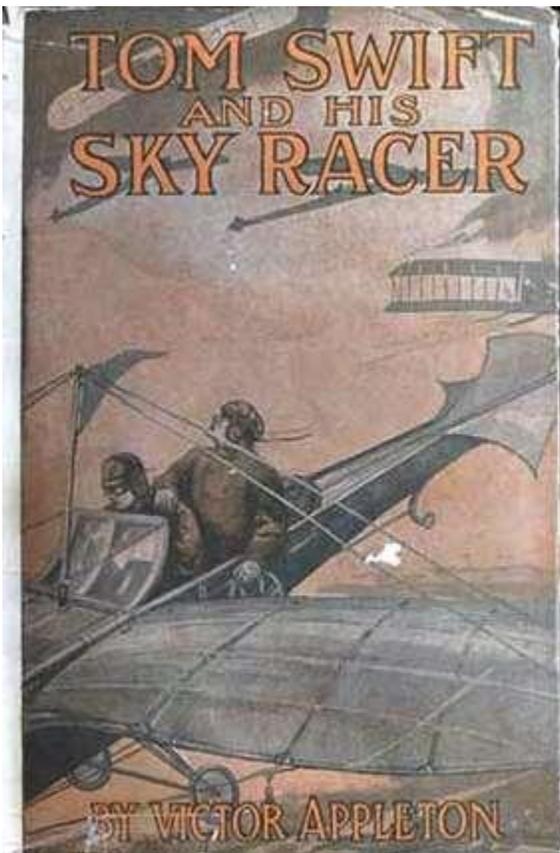
The Japanese Air Racer--Loi Tong. Little in stature. (Name sounds Chinese.)

The Government Agent--No name or description given. Wants to secure the plans for *Humming-Bird* for use by Uncle Sam.

Major Inventions

Tom Swift invents something major in this book. It is a small 2-seat racing monoplane that is planned to go 100+mph. The 2-seats are side-by-side and the craft has all the amenities for modern air-travel, including a rudimentary autopilot stabilizer and an aircraft wireless. Based once again loosely on the Bleriot design, it is "improved" by being smaller, lighter and more streamlined. It is powered by a lightweight aluminum 4-cylinder motor that develops a mighty 1000 pounds of thrust at 2000 rpm, later boosted to 2200 pounds by Tom's tuning and a thorough break-in. It sports a dual engine bearing lubrication system. While frail in appearance, it is a "sturdy" craft that uses "many braces and stays," and has "extra guys" to make it suitable for high speed operation. The aircraft wireless is also smaller and more light weight than other examples of the day.

Commentary on Society, Attitudes, Environment & Errata



It's amazing how much society and technology have changed in 95 years. Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted, like modern surgery and hospitals. It also gives me an appreciation as to how much society has changed, too. I wonder what people will be taking for granted 100 years from now, and what they will think of our times, mores and attitudes?

Attitudes, Prejudices and Circumstances: Medical advice having to do with drugs was mostly accurate. Aromatic spirits of ammonia administered to Mr. Swift are considered an anti-anxiety remedy, as well as the traditional "smelling salts" wake-me-up. However a caution was listed in the medical handbooks of the day, not to administer aromatic spirits if the patient was unconscious. Tom's father was out cold when he was given this remedy to drink. Rad is administering peppermint to Boomerang, presumably for dyspepsia, although later it is said the faithful animal is lame. Dr. Gladby is apparently also an Apothecary, and mixes medicine for Barton on-site, from ingredients carried in his bag. As far as the "rare and delicate" surgery performed on Mr. Swift, see Fact vs. Fantasy, below.

Pocket flash-lights are now available that incorporate Tungsten filaments for a "powerful beam." A Dark-Lantern is mentioned several times. This is a device (presumably oil or kerosene-fired) that has a sliding shutter to turn the light "off" when not needed, but without extinguishing the flame.

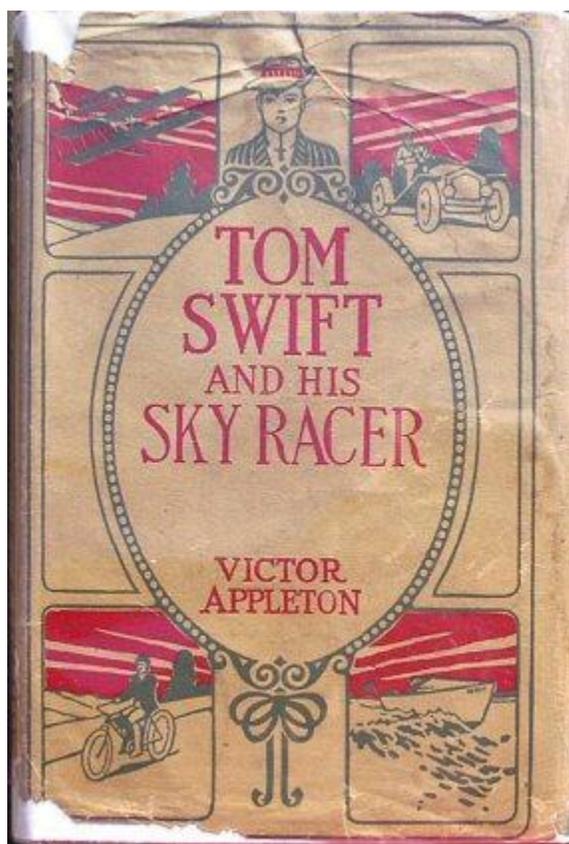
Tom keeps a revolver in his bedroom, but when attacked by a hatchet-wielding intruder, is unwilling to shoot the perp. He is laid low by the bad-guy and suffers a concussion and serious scalp wound. Guns seem to only be used as a non-detering deterrent in these stories, unless dealing with "savages" or wild animals. Speaking of guns, Rad "cannot be trusted with a gun." No reason was given, but the old prejudice about slaves and firearms was apparently still strong. Rad is also described as a "dirt chaser" in his function as cleaning man.

The Swift home has an "observation platform" on the roof. This leads one to deduce the structure was Victorian style. The house also had at least one lightning rod on the roof.

Tom and Dr. Hendrix are both Believers, and call upon God in prayer to heal Mr. Swift.

Errata: On p79 Tom test flies his new craft and leaves the ground "by tilting the wing tips." This would induce a snap-roll, ending Tom's aviation career abruptly. Flaps would cause a sudden lift, but they would

have to be inboard on the wings. Frankly, flaps hadn't been invented yet, even by Tom. On p130, the globe-shaped incendiary bombs would have rolled off the sloped roof of Tom's airplane hangar. No mention was made of penetrating the roof, and if they had, the fire would have started inside the building. The title page illustration shows the Humming-Bird as a 2-seat front-to-back, not side-by-side, as is described in the text. Also, the occupants were said to sit "below" the motor. In both the illustration and in the planes HB is based on, the motor is forward and the pilot sits high where he/she can see to navigate. On p200, the HB is said to have propeller(S). One engine, one prop, no consistency.



Engineering and Science, Fact vs. Fantasy: The classic "infernal machine" in the form of a ball-shaped bomb was used to set Tom's aircraft hangar on fire. That this device stayed on a sloped roof long enough to do any damage, was amazing, since it was dropped from a diving biplane. Contents were presumed to be some kind of acid, as there was no explosion, but many fumes. The ball was found in the remains of the building. A breakable glass carboy would have been more believable.

Aircraft motor development was impressive in this tale. The *HB* motor, a 4-cylinder air-cooled rig swings a 10 foot diameter prop. It develops 1000# thrust at 2000rpm, initially. After break-in and some "tuning" by Our Hero, the thrust is upped to 2200# with no apparent change in either speed or propeller pitch. The run-of-the-mill airplane engine was stated to develop 4-500# thrust from an 8 foot prop at 1000rpm. Some tune-up!!!

Later, Tom is sitting behind the wide open exhaust of his airplane, roaring along at 130mph, and has a fine conversation with Mr. Damon, as well as being able to hear wireless messages thru a single earphone.

The motor quits in flight due to a loose magneto wire. Tom is able to repair this without getting lit up by the magneto, because the propeller that had previously been wind-milling was stopped. After the repair, the motor restarts without benefit of a self-starter, which hadn't been invented yet.

The medicine: the medicine.... It's apparent the authors had even less exposure to surgical procedures than they did to airplanes. Barton Swift's malady, described as a "heart attack," started with memory loss, and confusion. It resulted in his swift <sic> collapse and unconsciousness. It sounds like there was one or more blocked arteries supplying blood to his brain (Intracranial Arterial Stenosis.) A TIA (Trans Ischemic Attack) would have also caused these symptoms, but would have cleared more quickly and without invasive procedures. Also possible are Cardiac Arrhythmia or Atrial Fibrillation. Myxedema with Coma, has even closer correlation to his symptoms than the Arrhythmia, although it is not treated surgically. Bottom line is, none of these conditions are treatable by any kind of "operation" performed on a dining-room table, and with the technology of 1910. Poor Barton would be toast in a real world.

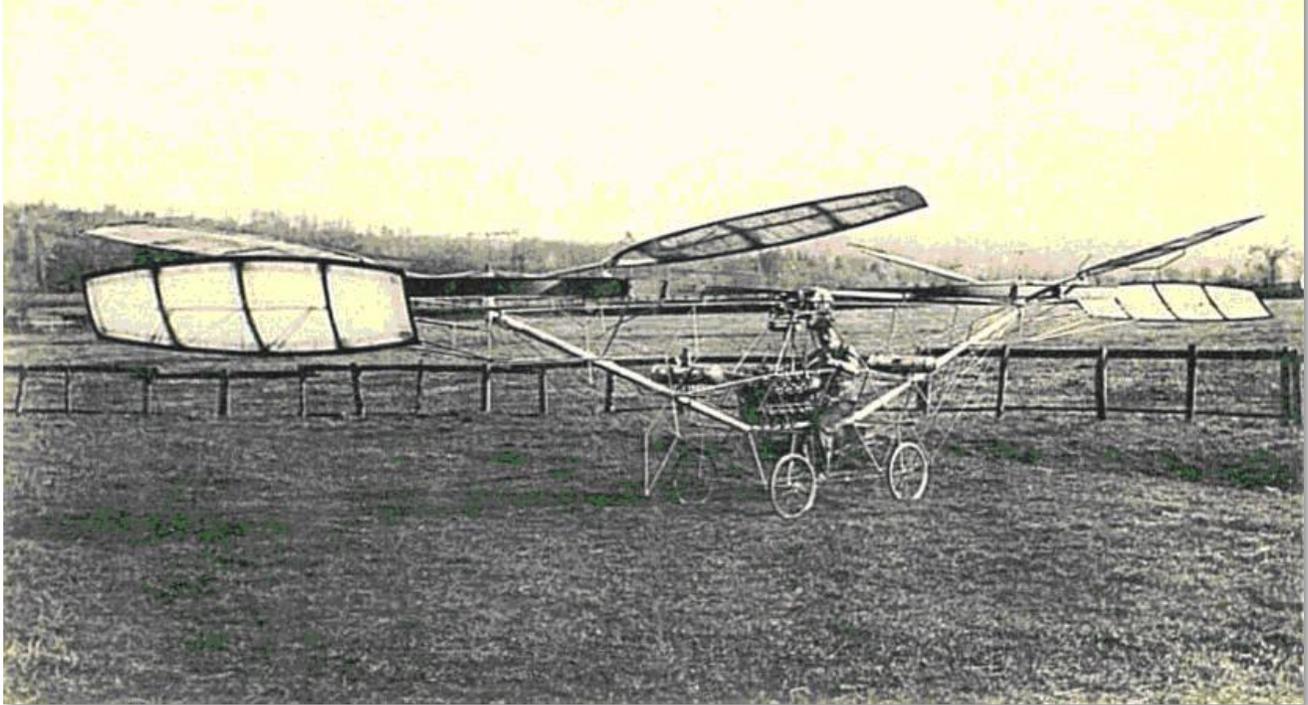
The "rare and delicate" surgical procedure "near his heart" performed on Barton, is over in about 60 minutes. Mr. Swift is conscious and able to talk to Tom, shortly thereafter. Ether, the anesthesia of choice in those days, doesn't wear off that quickly, and Barton would have been either in post-op shock from pain, or doped to the eyeballs with Morphine. In either case, talking to Tom moments after his procedure is fantasy. Barton makes a truly remarkable recovery, considering the level of medical competence exhibited.

De plane! De Plane!! Andy Foger's invention, the *Sluggex*, is described as a biplane hybrid incorporating the best features of the Santos-Dumont biplane and Cornu helicopter. Getting such a beast to travel even 50mph, would have to involve great altitude and free-fall. To the right is a photo of the Cornu. The Santos-D is below.

The first helicopter to make a successful manned flight was that of the Paul Cornu. On 13 Nov 1907 near Lisieux, France, the twin-rotor helicopter rose about 30 cm off the ground and remained there for about 20 seconds. The fabric covered rotors were fitted onto two bicycle-type wheels, which were driven by belts from a 24 h.p. engine. Heavy and unstable, the Cornu Helicopter nevertheless demonstrated (simultaneously with another French helicopter by Louis Breguet and Professor Richet) the feasibility of rotary-winged flight.

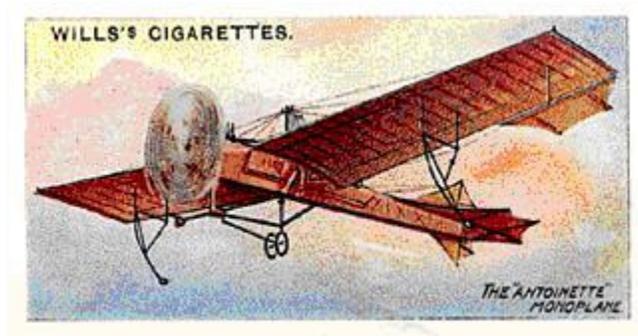
68 LES PIONNIERS DE L'AIR - L'Hélicoptère Paul CORNU

C. M.



Tom's creation combines the best features of the Bleriot, the Antoinette, and the Demoiselle. It has a round, rather than square or open frame fuselage and side-by-side seating. Not the best for streamlining frontal area-wise. A spy photo is shown, below, along with his race competition.

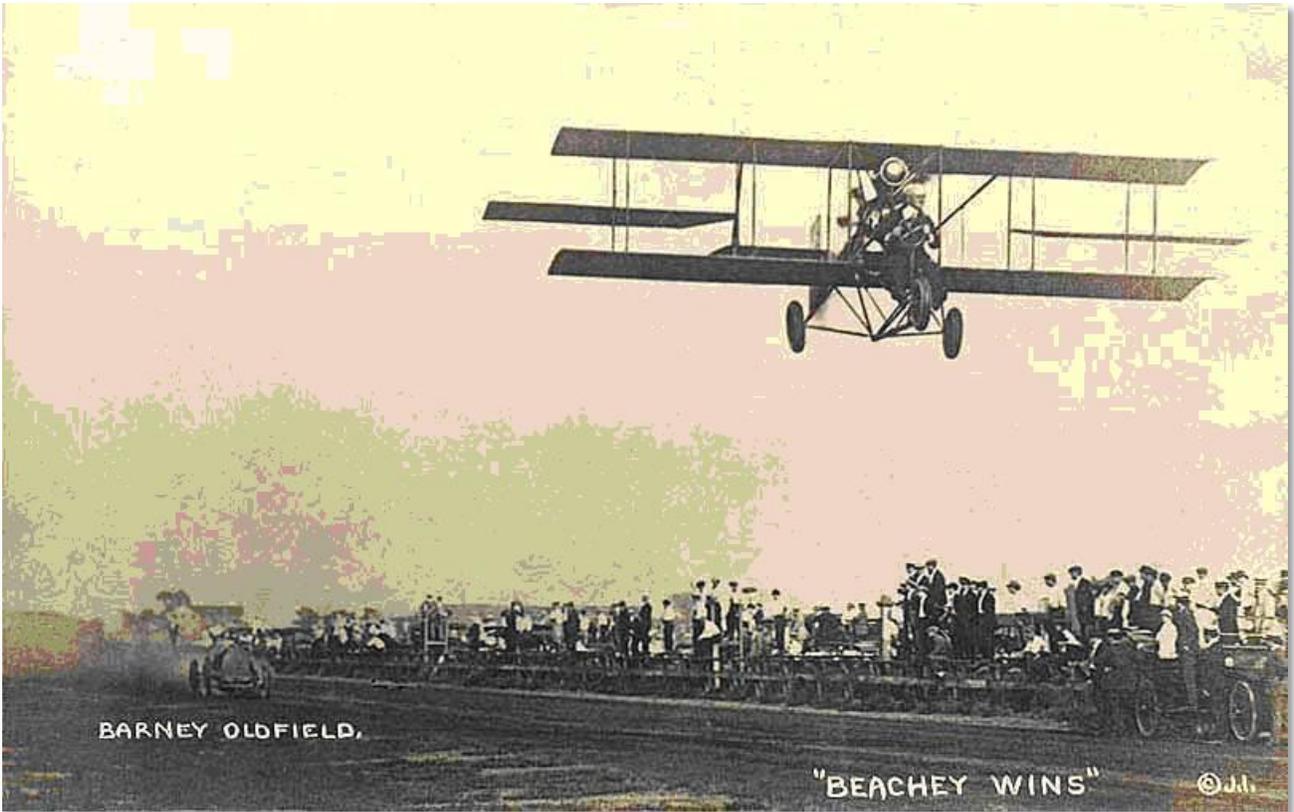
The biggest goof about these race planes is that not all of them are 2-seaters, a requirement for entry in the Eagle Park event. Also I suspect few if any were capable of 100 mph, except in free-fall. At no time are passenger/mechanics described, except Mr. Damon. See pictures, below.



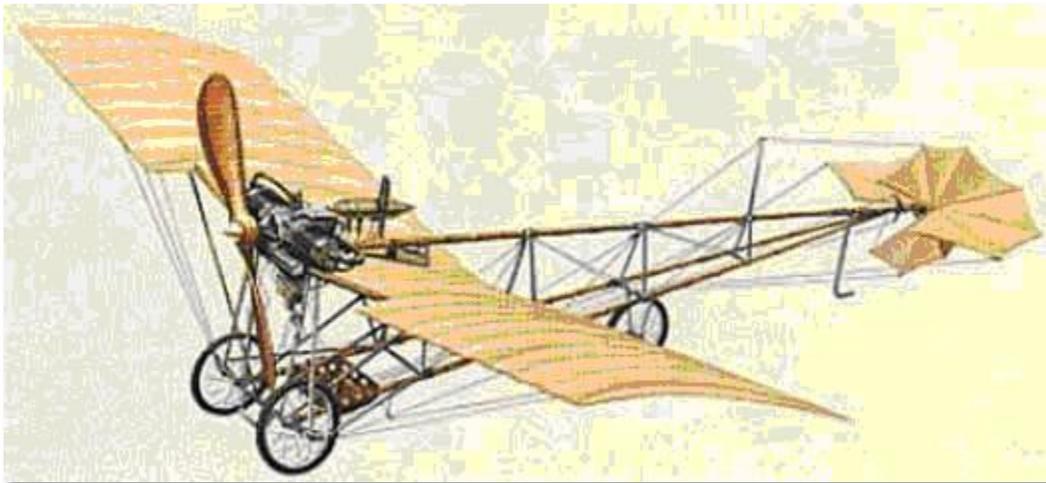
Antoinette -- Flown by Alameda
(Single seat)



Bleriot -- Flown by Perique



Curtiss Biplane -- Flown by Wendell
(Single seat)



Demoiselle -- Flown by Lascalle
(Single seat)

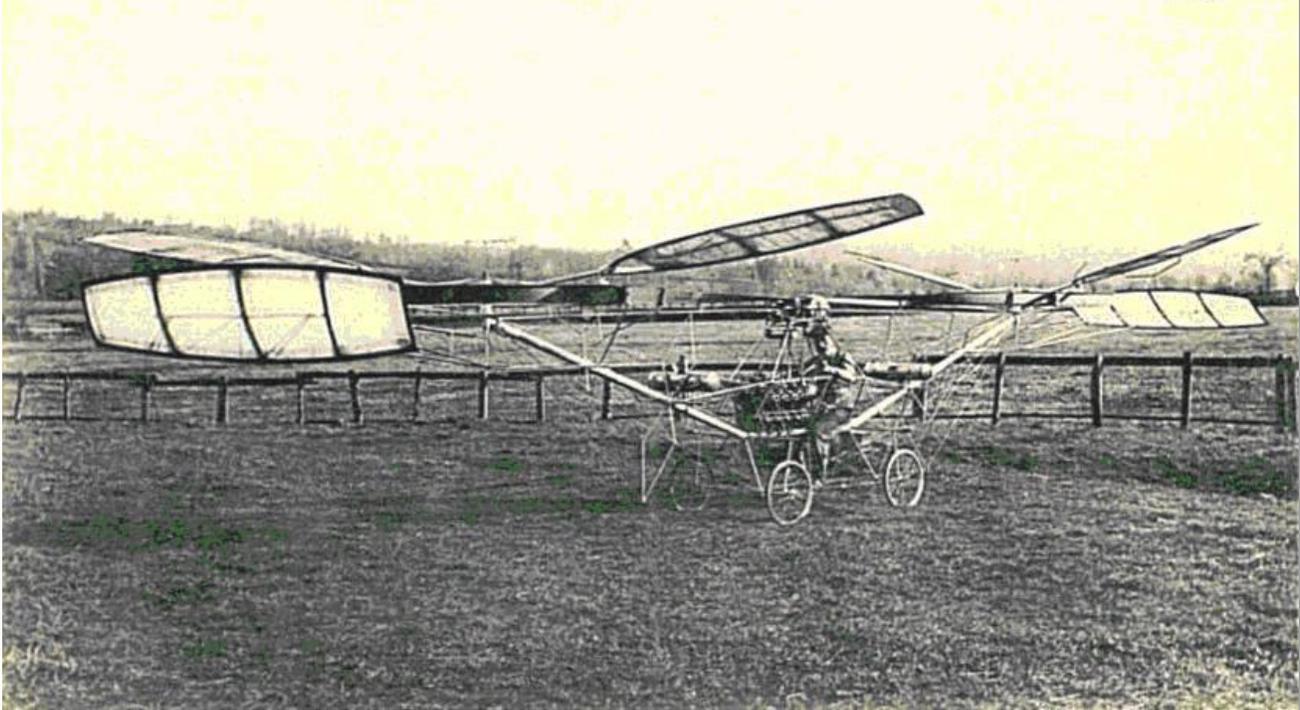


Farman -- Flown by De Tromp

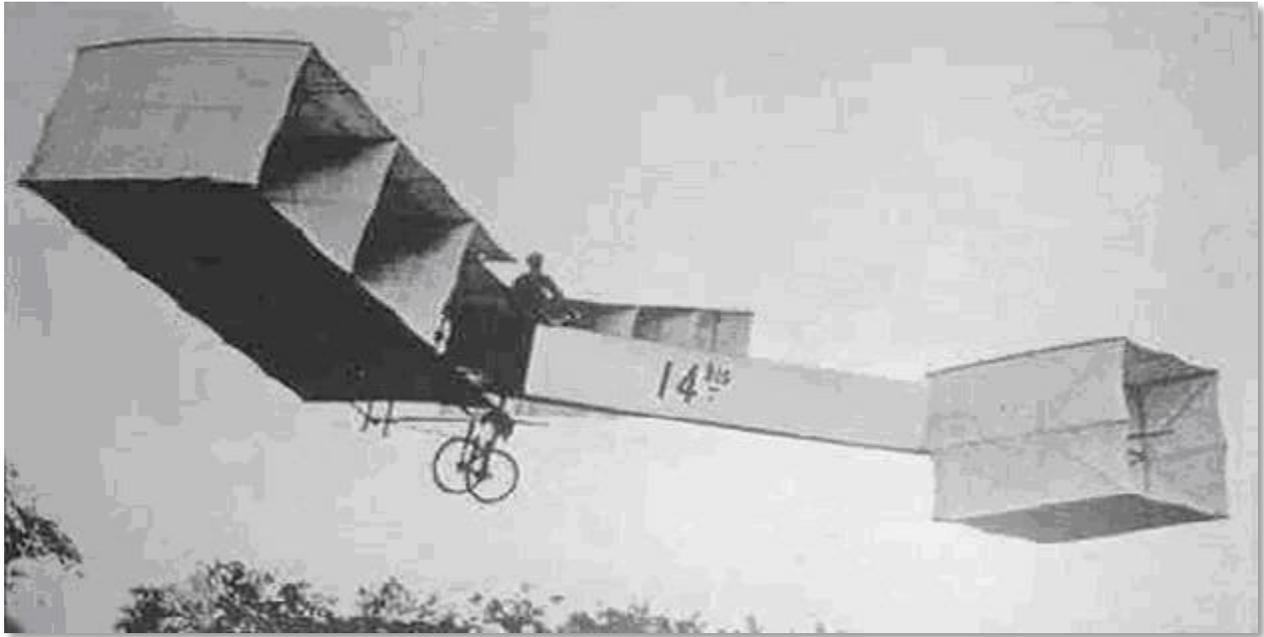
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68 LES PIONNIERS DE L'AIR - L'Hélicoptère Paul CORNU

C. M.



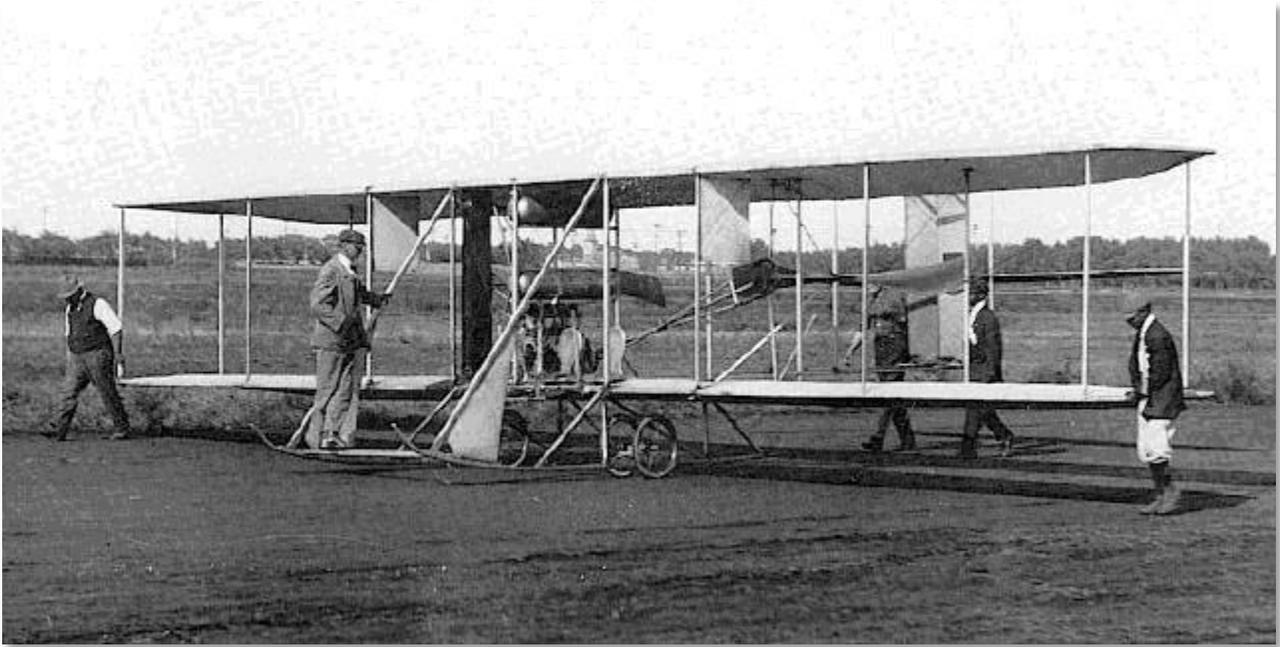
Foger's Folly -- Flown by Andy Foger



Santos-Dumont -- Flown by Loi Tong
(Single seat)



Humming-Bird -- Flown by Tom Swift



Wright Biplane -- Flown by Von Bergen

Hummingbird spy photo by the author.

Geography & Environment: Town/City of Westville NY, (the race site) is an unspecified distance or direction from Shopton. It is stated to be located "in a valley." The Village of Hampton is stated to be 50 miles away. No direction or state is given. Kirkville is 100 miles in an unspecified direction from Shopton, but near a "broad river." This would have to be the Hudson, the only "broad" river within range of the hypothetical Shopton.

JP Karenko 5/25/05

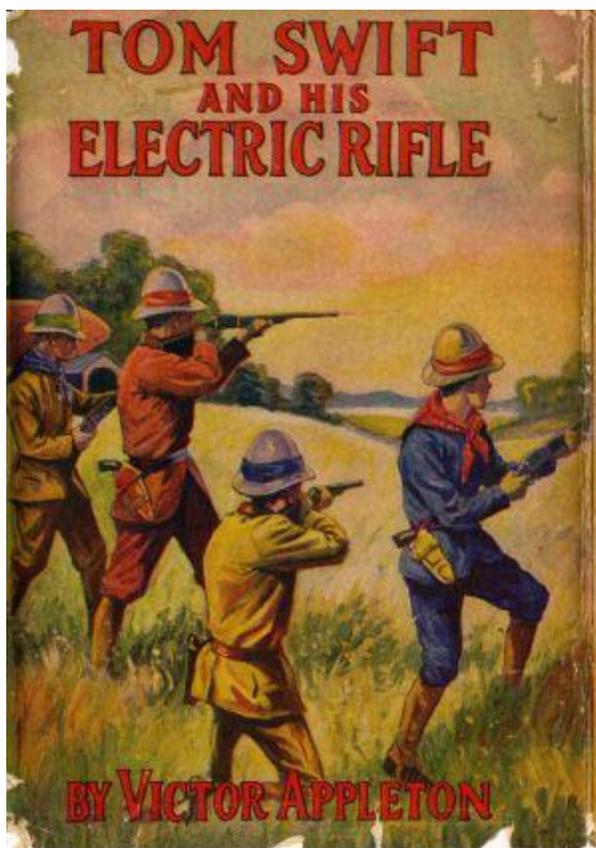
#10. Tom Swift and His Electric Rifle (1911)

or, Daring Adventures in Elephant Land

Review by JP Karenko, June 2005

Full-color image courtesy of Carl Swanstorm

Duotone and White Quad images courtesy of Mark Snyder



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

The story opens with Tom daydreaming of African Safaris while test-firing his new *Electric Rifle*. It works too well and toasts a hole in his neighbor's dining room wall, prompting an outraged visit from the toastee-in-question. A quick application of cash settles ruffled feathers, and some unspecified safety features are added to the weapon, to prevent a recurrence of the accident. As luck would have it, a famous African Safari Master is in town, shopping for a new big game rifle. He hooks up with Tom and a new custom-built airship, the *Black Hawk*, is designed & constructed. Tom, Ned, Mr. Damon and the hunter, Mr. Durban, are off to the Dark Continent via steamship, in search of ivory and adventure.

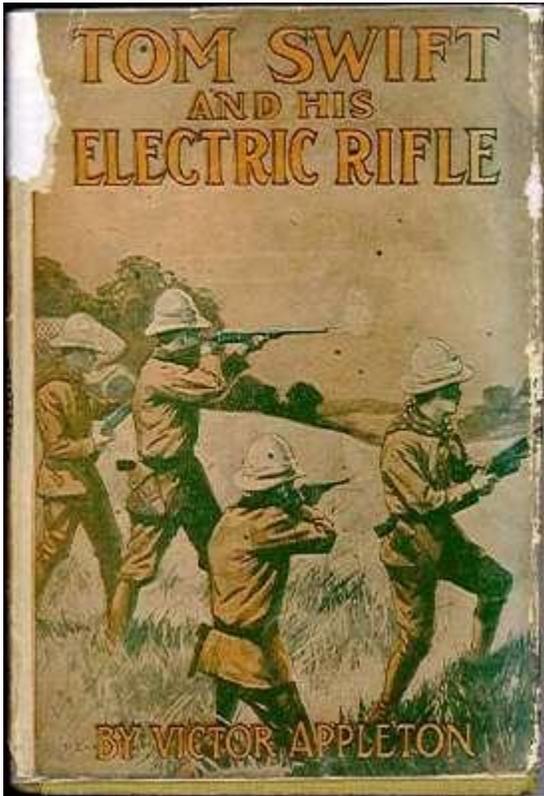
The group crosses paths with Floyd Anderson, who was introduced in Book #6, *Wireless Message*. He is on a quest to rescue a husband and wife Christian missionary team captured by pygmy savages in the jungles of the interior of Africa. The Quest now becomes ivory, adventure and

rescue.

Danger encroaches at every turn, and Tom gets to use his new weapon to slay an amazing variety of beasts that swim, crawl, and stampede around him. Needless to say, the rifle is effective on smaller but no less dangerous creatures, too, and does fearful duty when the group is attacked by savage tribesmen.

You can probably guess the outcome, but you'll have to read the story to be sure.

Cast of Characters (More or less in order of appearance)



Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. Is a decent cook, too.

Ned Newton--Chum & companion of Tom, currently employed in Shopton 1st National Bank.

Jack, The Newsboy--NLN or description given. Passing mention.

Barton Swift--Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. In this episode, recovering from severe medical condition affecting his heart and circulation.

Eradicate Sampson, A.K.A. Eradicate or Rad--Rad's middle names, (Andrew Jackson Abraham Lincoln) are no longer used. Aged stereotypical Negro journeyman jack-of-all-trades. "Eradicates dirt." Now is in full-time residence on the Swift estate, and maintains his own chicken coop. Heavy deep-south accent and

Uncle Remus attitude. Caretaker of **Boomerang**, a cantankerous, aged and now ailing, mule.

Mrs. Baggert--Housekeeper. Kindly, and "loves Tom like a son." Employed by the Swift family since the time Tom's mother died. She is short of stature and has to stand on a soap box to kiss Tom goodbye on one of his voyages. Excitable, she seems to expect fatalities after any mishap involving Tom's inventions.

Garrett Jackson--Aged (65+ years old) "engineer" who is more a handyman/machinist and watchman type than engineer. Resides on Swift estate, now in an "apartment" inside the Swift home.

Barney Moker--Miserly, paranoid and opportunistic town "character." Neighbor to Swift estate. Likes to shout a lot. Accuses Tom of mayhem & attempted murder when his dining room wallpaper is scorched by a stray plasma bullet from the *Electric Rifle*.

Alexander (Aleck) Durban--No description given. African big game hunter and safari leader. Visiting his sister (Mrs. Douglass) in Waterford while shopping for a new elephant rifle, in Shopton, of all places.

Mrs. Douglass--NFN or description given. Sister of Durban, above. Passing mention.

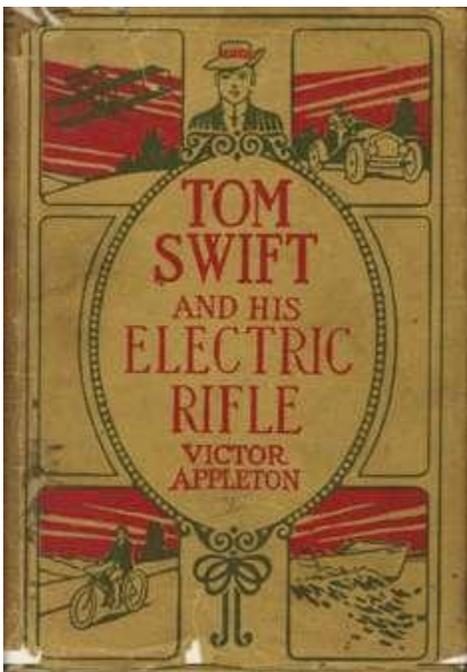
Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. Lousy shot with a rifle. (Not a good hunting companion, in my book.)

Miss Mary Nestor--Love interest of Our Hero. Passing mention in this episode.

Floyd Anderson--Of Earthquake Island. (See book #6) On his way to Africa to rescue missionaries captured by the Red Pygmies. (See below.)

Cast of assorted steamship passengers and sailors--Provide an admiring audience when Tom zaps an attacking whale with his rifle during their trans-Atlantic voyage.

Mr. Laster--NFN or description given. Mate of *SS Soudalar*. The boat attracts the interest of the whale, forcing Tom to zap it, as above.



Captain Wendon--NFN or description given. Master of *SS Soudalar*. Passing mention, except as possible customer for one of Tom's rifles.

King of the Natives--No name given. Large black native, dressed in a leopard-skin cloak and a derby hat.

Interpreter--No name or description given, except "small." Plays part of Mutt to King's Jeff.

Red Pygmies--Central African tribe, noted as fierce and ruthless warriors. Short of stature (~ 1 meter tall) and covered in reddish-tan hair, they make up in numbers and aggressiveness what they lack in size.

Tomba--Native manservant of Illingways. Escapes captivity and summons help to rescue his charges. Somehow is able to see in pitch dark jungle, said ability being crucial, late in the story.

Rev. and Mrs. Jacob Illingway--No descriptions given. Protestant Missionaries to the Dark Continent, captured and imprisoned by the Red Pygmies. Mrs. Illingway's first name is never mentioned.

Andy Foger--Red haired, squinty-eyed bully, who has made great trouble for Tom in the past. In this tome, demonstrates a spark of goodness and remorse for past transgressions. May there be hope for him, yet???

Herr Landbacher-- NFN or description given. German Aeronaut, designer and builder of both Andy's "*Sluggger*" (See book # 9) and this episode's long-range airship. Oh-for-two in the airship design department, since both crash.

Major Inventions

Tom Swift finishes inventing something major in this book, the *Electric Rifle*. Introduced in a previous episode, (*The Caves of Ice*) the device is now more-or-less complete. It still needs some work, as the stun/kill/disintegrate adjustment is too indiscriminate. Also, due to the extreme destructive power at the terminal distance, safety issues regarding accidental discharge or mis-adjustment need to be addressed.

The rifle resembles an oversized (but lightweight) heavy-game firearm in appearance, except for "dials, levers, gears and wheels" on the shoulder stock. It throws a (plasma?) "bullet" that can be adjusted to "discharge" at a given range with a force varying from "stun" to "disintegrate." (See photos, below.) The WSoD part (Willing Suspension of Disbelief) of this invention, is the ability of this charge to travel thru walls and intervening barriers without loss of energy, "find" a target that cannot be seen and selectively dump its' energy on that target only. A lion, carrying off a tribesman is killed in its tracks, while the injured native (clamped in the lion's jaws) is unharmed. The rifle is charged by a small dynamo and contains a storage device for this charge in a cylinder contained in the butt-stock. This is presumed to be a capacitor or battery, although no details are given. No "magazine capacity" is quoted, but Tom never seems to have to reload. Also, there is no annoying recoil, noise or smoke produced when it is fired.

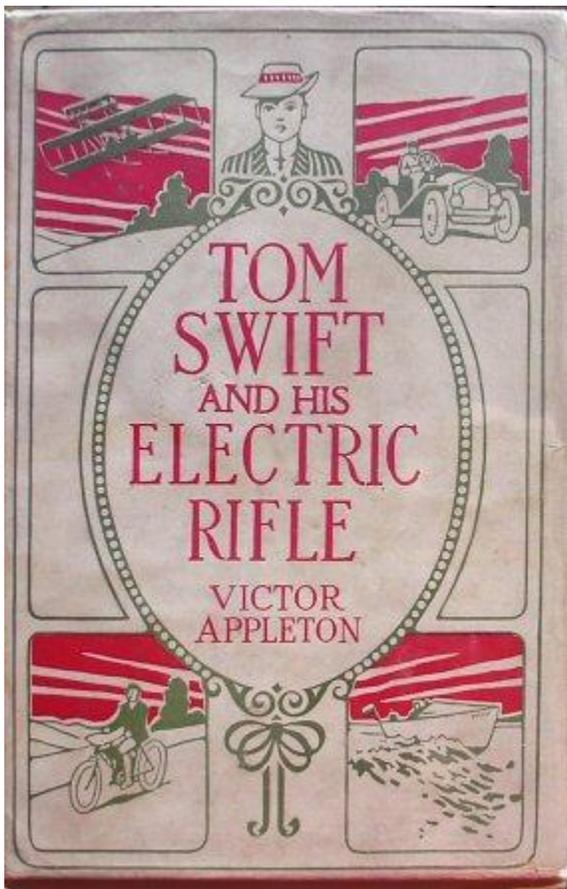
The *Black Hawk* is also designed, built and flown in this episode. (In record time, to boot.) A smaller, lighter, and faster, yet equally luxurious cousin to the destroyed *Red Cloud*, it has all the comforts of the previous airship, plus extended range and the ability to run the driving propellers in "stealth mode" via auxiliary electric motors. No dimensions are stated, but that gas bag would have to be mighty small and sleek to get this beast to exceed the stated top speed of *Red Cloud* (90mph.) *Red Cloud* as a speed ship, was frankly, ludicrous. Something with a span exceeding 300ft and the frontal area of a large hay-barn, just will not go 90mph on a 20hp motor, no matter how well tuned up it is.

Commentary on Society, Attitudes, Environment & Errata

It's amazing how much society and technology have changed in 95 years. Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted, like modern transportation and communications. It also gives me an appreciation as to how much society has changed, too. I wonder what people will be taking for granted 100 years from now, and what they will think of our times, mores and attitudes?

Attitudes, Prejudices and Circumstances: The 3rd Law of Gun Safety - Always Be Sure Of Your Target And What Is Behind It is casually disregarded, with near-disastrous results. Tom's "magic bullets" travel through all barriers (including any thickness of armor plate) and due to careless handling and inadequate forethought, he scorches a hole in his neighbor's house. A potential lawsuit is forestalled by an out-of-court settlement (some things never change...) amounting to the princely sum of \$12 cash. The sum is said to be sufficient to re-wallpaper the entire room. Prices are interesting. The New York Times sells for 5¢, and the hardcover (presumably 2nd edition) volume of *Electric Rifle* (ER) that I have in my collection sold for \$.50, a 25% increase over the original edition's posted price of \$.40. Steep, for a kid's book in 1911. Ivory is already becoming scarce and expensive, with a set of prime elephant tusks bringing

\$1000. In spite of this, it is OK to go decimate not one, but several elephant herds, just to harvest their teeth. Back to the "gun stuff:" Tom sets up a human (scarecrow) target to practice on, in direct contrast to his previous attitude regarding shooting people. In a previous episode, he was attacked and given a serious concussion/head wound, by a hatchet-wielding bad-guy. Although armed at the time, he refused to shoot in self-defense. This attitude seems to whipsaw back and forth throughout the series. One thing that does remain constant is, that it appears to be OK to shoot people, as long as they are "savages." Africa is still a great unknown, even to the authors of this series. Eradicate, is Negro and likely an ex-slave. He is presumed to have been born in the USA, probably during the Civil War years from his age, but is expected to "have friends on the Dark Continent, and to know the language(s)." Those (Black) friends are without exception, described variously as "simple folk, easily frightened and superstitious, dressed in loincloths, bones, leaves and feathers." All are "savages," and "caper" and "chatter" when excited. The (Red) folk are denigrated even more, being described as above plus as "imps, only subject to the vengeance of the White man." This may reflect my own prejudices, but the very first image that came to my mind regarding the enmity between these two varicolored peoples was a documentary I saw as a child about large black and small, but numerically superior red ants. They were mindlessly warring. It was an old documentary, and perhaps the authors were inspired by it or something similar, when writing this tome. (BTW, in the documentary the black ants were swarmed by their smaller foes and lost the "war.") Interestingly, rescuing the missionaries was always secondary to getting ivory. There appeared to be no rush to find the Illingways, in spite of imminent danger of death. Mr. Anderson's presence was solely for the purpose of rescuing the captured church people.



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Errata: Mr. Damon is back in *Waterford*, NY. I'm going to have to start a score sheet to keep track of his many moves between there and *Waterfield*. On p36 Tom destroys some bix (big) boxes with his rifle, during target practice. I can't rationalize what makes a wood packing crate explode when hit by a plasma bolt. Burn, yes, but I expect there would not be enough water in the wood to cause a steam explosion. On p92, Ned can't tell a Hippo from a Pachyderm. (Not sure I want him going hunting with me, either...) On p186, the ER fired at full charge mows down natives in rows (a la Civil War cannon shot) rather than disintegrating them, as it does with animals. On p195, the black natives suddenly become hostile. They previously had been friendly and/or superstitiously awed by the airship. Tom bombs them from the air. Poison blowgun dart wounds are merely treated with antiseptic. Tomba, the Illingways' African servant speaks like a South Carolina cotton-harvester. Pidgin English or trade-lingo would have been more fitting.

Character development in the episode stunk. Many characters (even main ones) are introduced without so much as mention of their full names or descriptions. Andy Fogger appears to turn over a new leaf in this

tome, begging Tom for forgiveness for past wrongdoings. In the next volume, he's right back to his old tricks and attitudes. Different author or bad staff coordination at G&D? Actually, the writing style is enough different in this volume, that I suspect a new ghost writer was brought on board to do this one. Since the writing style reverts in the next volume, this author's career at G&D may have been short.

Engineering and Science, Fact vs. Fantasy: The secret of the Electric Rifle seems to have been lost to modern man. The idea of a variable strength, select-range weapon that is "safe" until it reaches the intended target, is still beyond the technology of 2005. Self-seeking missiles and timed ranging small-arms projectiles are reality, today, but not in the clean, simple and environmentally friendly package that Tom has invented. Have no fear, though. We will someday develop this weapon. A glimpse into the Hollywood time machine confirms this. The images, below, are © 1956 by Turner Communications, from *Forbidden Planet*. Note the "illuminating charges."



Electric Rifle & Pistol in Action



Electric Pistol Variant Set On "Toast."

The *Black Hawk* is "smaller, lighter and faster than the *Red Cloud*. I always figured the *Red Cloud* was written out of *The Caves of Ice*, because the authors finally figured out that you can't get something with the frontal area of a large hay-barn to fly fast enough to make wings effective, much less go 90mph. Also, how you attach those wings to a gas bag, rigid or not, was never explained. Like a horse going back to a burning barn, they needed an aircraft with VTOL and a dirigible-ish device was all that was available for Tom to "improve." I wonder if the 3rd generation "improved lifting gas" was less flammable and hazardous than the first two variants. Tom also seems to have solved the problem of significant gas bag leakage, too.

Geography & Environment: It's apparent that the authors gained much of their "knowledge" of Africa by watching Johnny Weissmuller movies. Wait-John was only 7 years old in 1911, and the 1st Tarzan movie was released in 1918. Hm! Still, the "jungle" as described is very Hollywood stereotypical and the flora, fauna and native tribesmen are all straight out of Southern California. Perhaps the writers in TinselTown read Tom Swift as kids?

In reality, the only place in the interior of Africa to encounter all the various critters Tom slew (Cape Buffalo, Elephant, Rhino, Lion and Python) is either Kenya or Uganda. Both have the varied topography

that was encountered, but both are a bit short on true "jungle," as was described. Kenya's coast is heavily forested, but most of the "jungle" action took place in the interior. In any case, boating to a coastal port of Kenya and flying west might have been more efficient than the route they took, flying east. Africa is a BIG place.

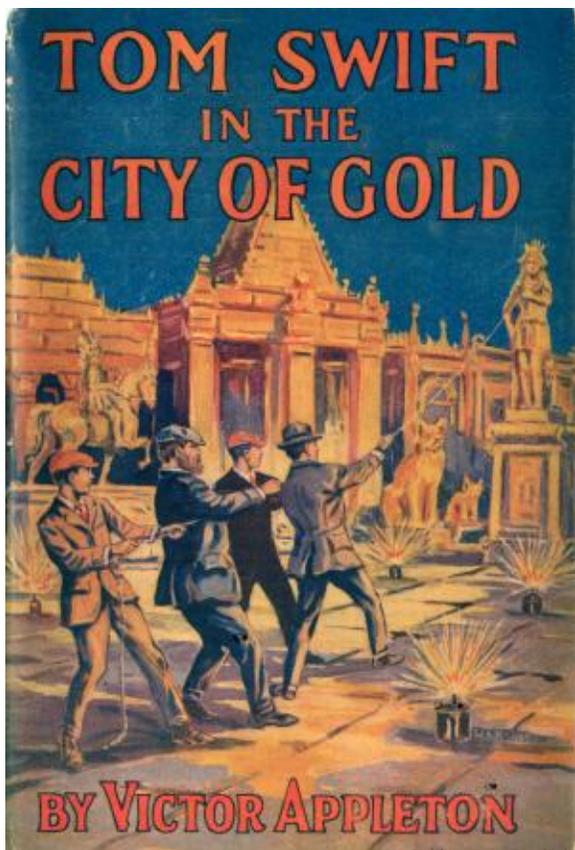
JP Karenko 6/10/05

#11. Tom Swift In The City of Gold (1912)

or, Marvelous Adventures Underground

Review by JP Karenko, June 2005

Image of a White Quad and Duotone dustjacket courtesy of Mark Snyder; full-color image is courtesy of James Keeline



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

The story opens with Tom receiving a letter from Africa, containing a crude map. The rest of the story can be summed up in a mere three words: *Acute Gold Fever*, or AGF. Jacob Illingway, the Protestant missionary Tom rescued from the Red Pygmies of central Africa, has sent word that an underground city exists in central Mexico. This city, built by ancients, (possibly Aztec Indians) contains riches untold for anyone who can find it, and get past the guardians, a tribe of head hunters.

The rest of the tale chronicles the hardships that were encountered while locating the city and attempting its' plunder. You can probably guess the outcome, but you'll have to read the story to be sure.

Cast of Characters (More or less in order of appearance)

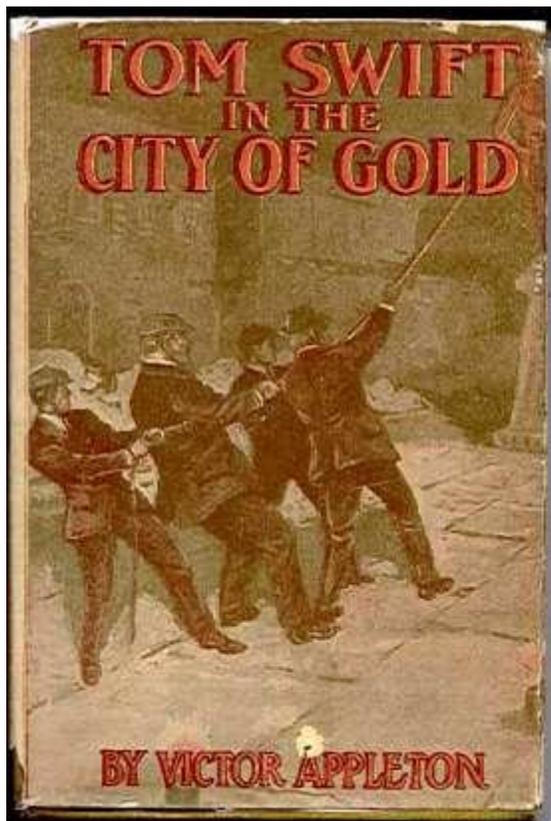
Mr. Wilson--NFN or description given. Postal delivery person and admirer of Tom's adventurous lifestyle.

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. Is a decent cook, too.

Mrs. Baggert--Housekeeper. Kindly, and "loves Tom like a son." Employed by the Swift family since the time Tom's mother died. She is short of stature and has to stand on a soap box to kiss Tom goodbye on one of his voyages. Excitable, she seems to expect fatalities after any mishap involving Tom's inventions.

Barton Swift--Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. In this episode, apparently recovered from severe medical condition affecting his heart and circulation. Back at work on a new gyroscope.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person.



Ned Newton--Chum & companion of Tom, currently employed in Shopton 1st National Bank.

Mr. and Mrs. Jacob Illingway--No descriptions given. Protestant Missionaries to the Dark Continent, captured and imprisoned by the Red Pygmies. Mrs. Illingway's first name is never mentioned. See Attitudes.

Andy Foger--Red haired, squinty-eyed bully, who has made great trouble for Tom in the past. In this tome, has lost the spark of goodness and remorse for past transgressions that was kindled when Tom saved his life in *Electric Rifle*. Back to his old tricks, he overhears talk of treasure in Mexico and learns the general location of the gold.

Mr. Foger--NFN given. Described as a large man with florid complexion and a heavy brown moustache. In this tome, he is near poverty, having lost his millions to shady dealings. Sells his Shopton house and furniture to go treasure hunting.

Eradicate Sampson, A.K.A. Eradicate or Rad--Rad's middle names, (Andrew Jackson Abraham Lincoln,) are no longer used. Aged stereotypical Negro journeyman jack-of-all-trades.

"Eradicates dirt." Now is in full-time residence on the Swift estate, and maintains his own chicken coop. Heavy deep-south accent and Uncle Remus attitude. Caretaker of **Boomerang**, a cantankerous, aged and now ailing, mule. Unwillingly takes a balloon ride in this volume, and goes along on the adventure for the first time in the series. Dislikes air travel, but overcomes fear of flying due to severe case of gold fever.

Miss Mary Nestor--Love interest of Our Hero. "Gold digger" (literally) in this episode. Extracts promise from Tom to bring back pair of matching gold bookends.

Mr. & Mrs. (Amos) Nestor--No names or descriptions given in this volume. Passing mention.

Mr. Wilson & Son--Mysterious reclusive passengers inhabiting Stateroom #27 on the voyage to Mexico. Later, we find out that they are the Fogers in mufti.

Mr. Sander--Self styled expert on porpoises. NFN or description given. Passing mention.

Mate of the SS Maderia--No name or description given. Passing mention

Miguel DeLazes--Native straw boss / labor contractor hired to run Tom's expedition.

Josef--NLN or description given. Passing mention.

Cast of Mestizo Drivers--No names or descriptions given. These folks wrangle the ox-cart transportation and provide Manuel Labore on the expedition.

Solitary Mexican Traveler--No name or description given. Passing mention.

Mexican Family--No names or descriptions given. Passing mention.

Headhunters--Not there to offer Tom a job...

Major Inventions

Tom Swift does "invent" something in this book, a third generation, down-sized copy of a previous device. It is a ¼-scale version of the Blackhawk, which was an already shrunk-down version of Red Cloud. All are "airships" of a combined dirigible and bi-plane design. The wings are used for speed travel and the gas bag for hovering or VTOL. This unnamed mini-marvel is now small enough to be packed cross-country on 3 ox-carts, and hidden unnoticed inside a ruined Aztec temple. It maintains all the comforts of its' larger predecessors except being "smaller and lighter." With a lifting gas bag that is only one eighth the size of its next larger cousin, it would have to be lighter, indeed. Much lighter! (Half-size cubed isn't a very big gas bag, regardless of the "power" of the vaporous contents...)

Commentary on Society, Attitudes, Environment & Errata

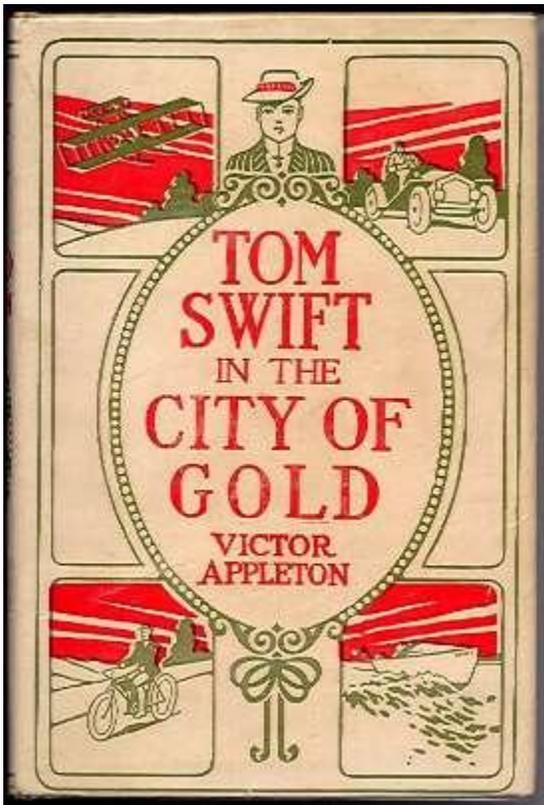
It's amazing how much technology has changed in 95 years. Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted, like modern transportation, communications, satellite mapping and air-conditioning!. It also gives me an appreciation as to how much society has both changed, and stayed the same too. Today, Gold fever still makes otherwise intelligent men do really stupid things, as was told in this tale of 1911. I wonder what people will be taking for granted 100 years from now, and what they will think of our times, mores and attitudes?

Attitudes, Prejudices and Circumstances: It was presumed that "Reverend" would apply to Jacob Illingway due to his church affiliation, but the honorific is never used. Late in the tale, the Illingways' Christian mission work is described as merely "humanitarian," rather than Evangelical. This is a major pullback from the "Protestant/Christian Missionary" description originally given them in Electric Rifle.

The envelope Tom receives from Africa is torn, frayed, and takes many weeks to get to Shopton. Looks like the Post Office was already gearing up for mistreating the mail (and then raising rates to compensate...) almost 100 years ago.

Aeroplane travel is quoted as "safer than street cars" with fewer collisions.

The mini-Blackhawk is collapsed and "packed into a small compass." It was found that the word usage described a construction method of interlocking tabs and slots similar to fold-up cardboard document storage boxes in use, today. Mr. Damon blesses his steamer rug, which is the blanket one uses to cover the extremities when sitting in a deck chair on board ship.



There is a very distinct and well-defined social pecking-order described in this book. My feeling is that the social aspects of this story outshine the rest of the plot by far, due to this insight, alone. Whites of any stripe, (even the Fogers,) are at the top of the food-chain. Next down are the black/negro races, as is represented by Rad. "Colored" folks are unabashedly segregated from whites, having separate accommodations for sleeping, eating and socializing on board ship. Next down are the pure Latino or part-Indian peoples, as represented by Senor Delazes, the "labor contractor." The most complimentary adjective used for him is "untrustworthy." At the bottom of the social heap are Los Indios. Ned is a typical "Ugly American," who can't tell refried beans from frijoles and complains loudly about it. Rad, who previously "couldn't be trusted with a gun," moves up a notch, and is given a large revolver for self protection. (against???) Arming any of the Mestizo or Indian help is out of the question, as "it is too dangerous." The Mexican help is also uniformly described as "ignorant, superstitious, sneaky, lazy, and untrustworthy." All things being relative, Rad, who was segregated from whites on board ship, eats and sleeps with Tom and Co, on land. The entire American party is

completely segregated from the local Latino help, taking meals and having tents separately. Also, Tom rides roughshod over the traditional mid-day Siesta, which was developed to survive pre-air-conditioned tropical days. This proves that it isn't just 'Mad Dogs And Englishmen That Go Out In The Middy Sun,' but American inventors, too. The headhunters don't even rate denigrating descriptions. There were a few leftover skull-swipers in the interior of Mexico in 1911, but interestingly enough, they seemed to get along quite well with the Fogers, late in the story. No accounting for the taste of some folks--or maybe the Fogers just didn't taste good, either...

Errata: Typos and inconsistencies were many. More so than any other volume, to date. Once again, it prompted questions about staff changes at G&D. On p5 pigmies rather than pygmies were found. P16 has the British spelling of gasolene and clew being used, again. (In ER, the modern spellings were used.) P46 has Mr. Damon an od (odd) man. P52 has him wearing slippers, not slippers. P80 has an engine ror-ing, and p90 has someone peak-ing rather than peek-ing. P102 refers to boat pasengers and on p119 the group

takes a turn of the trail rather than a trail. P17 Andy Foger is said to follow Tom to Africa, when he was blown there by a storm before Tom even left the US. P18 has Ned accompanying Tom on "many" adventures (2 so far-Caves of Ice and Electric Rifle) Rad is on his first adventure with Tom & Co. The text indicates he was present on many shorter trips (not!) Rad's deep-south dialect changes drastically, and he refers to (male) folks as "honey," repeatedly. He sounds more like Aunt Jemimah, than Uncle Remus, in this story. Mr. Damon is back in Waterfield, NY. The current score of his many moves between there and Waterford stands at: 7-Waterfield, 2-not recorded, and 4-Waterford, for 11 volumes, to date. Volume #8 and this one have him residing in both places at the same time. The Sky Racer (now nameless-it was Humming-Bird) has multiple propellers, and has the "deflecting rudders at the front of the plane instead of the rear. The name of the Blackhawk is forgotten as is the Electric Rifle, a perfect defensive weapon for spray-n-pray jungle warfare against headhunters. These consistent inconsistencies, plus several other glaring omissions and contradictions tell me that once again a new ghost writer is being brought on board, and that communication between these folks is minimal bordering on awful.

Engineering and Science, Fact vs. Fantasy: Upside: Acetylene lamps for underground area lighting were constructed out of materials at hand, a resourceful move, if the chemicals were available. Hand held flash-lights were described in detail, and appear to now be unremarkable, except that batteries seem to last a very long time-the Pink Bunny must be older than we think... Tom uses an "automatic revolver" as a sidearm. No detail is given, but this device appears to be a 6-shot .455 cal Webley-Fosberry. The 5-inch WF was noted for a smooth trigger pull and great accuracy. It was a rare piece, originally patented in 1895, but soon to be supplanted by the more reliable and quicker-reloading Colt 1911 Automatic. With the exception of the smooth trigger, there was very little advantage to this weapon over a conventional revolver.



Few of these ever made it to America, as they were not widely distributed. Most stayed attached to British Army dress uniforms via the lanyard loop. (This further confirms my suspicion that the ghost writers authoring this series were a bunch of Brits, but that's OK.) The most recent reference to the WF is in an obscure SciFi movie starring Sean Connery, called *Zardoz*. The movie didn't make much more sense than the mechanics of the pistol did...i.e. Not Much.

Downside: Early in the story, Andy Foger rigs the cables of Tom's Sky Racer to jam by wedging a bolt into the guides. How he did this quickly so it would happen at an inconvenient altitude, as opposed to immediately, was not explained. Turning a raging underground river on and off with a mere twist of a

stone knob, sounds farfetched. Unsupported mile-wide roofed caverns have never been properly explained to my liking in any of these stories. Moving a stone slab or dropping a trap door could happen if properly counterbalanced, but I wonder about dry 500-year-old bearings and levers.

Geography & Environment: The author(s) really had to stretch coming up with African sounding names for places. Gumba Twamba is the (major) port in Africa mentioned. Why not just pick a coastal town out of an Atlas??? Mexican topography is reasonably accurate, even in the interior. The port of Tampico is located about 200mi north of Mexico City, nearly as described. From there, the cartography becomes more fictional, but the central plateau and the city/region of Zacatecas are real, and in about the right places.



Central Mexico, Map Courtesy of Microsoft MapPoint

The central plain in Mexico is NOT jungle, however. It is a dry and desolate area. Jungle does abound, further south, and I suppose, Tom & Co could have gotten sidetracked. The temple, (hidden in plain sight, as it were) is described as round and domed, proving that the research done on the Aztecs was cursory at best. Aztec/Toltec architecture runs to stepped pyramids, not domes. While large, they would have to be hollow to be spacious enough to house even a "mini" airship. Since these temples were built on the ruins

of previous structures, they certainly were *not* hollow. Also, as described, Tom & Co entered at ground level. Poor, overweight and elderly Mr. Damon would have had a coronary, climbing the set of stairs, shown below. Although in these later stories, he seems to be more spry and in better health.



Aztec Temple at Chichenitza

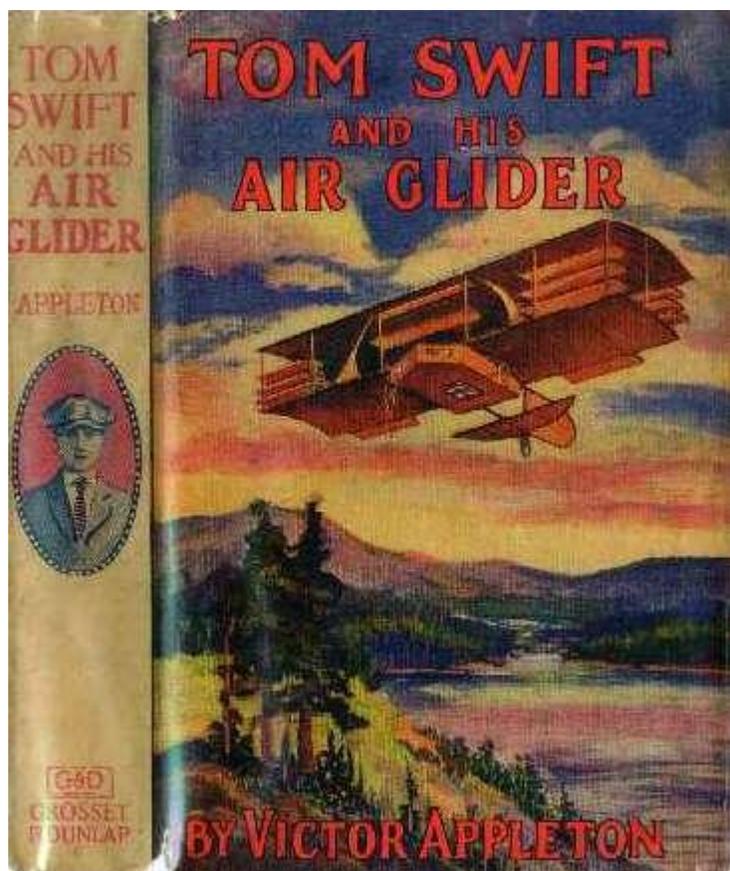
Much of the imagery in this story smacks of the first 15 minutes of *Raiders of the Lost Ark*-headhunters, golden idols, underground traps, betrayals...I'm certain some of the folks writing for Hollywood, nowadays, are ex-TS Sr. fans. Oh well, the stories *are* public domain, now...

JP Karenko 6/13/05

#12. Tom Swift and his Air Glider (1912) (Review 1)

Or, Seeking the Platinum Treasure

Image of a White Quad and Duotone dustjacket from the collection of Mark Snyder



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

The book opens with Tom trying with mixed success to get someone to go along with him and try out an airplane that he had recently been working on. After getting off to a good start and proving that his concept worked, the plane's engine died and Tom had to volplane back to earth. Upon checking for a problem, Tom found that his platinum-tipped spark plugs, due to the extremely bad quality platinum, had crystallized. Platinum, it seems, was becoming an ever-rarer commodity, and it was nearly impossible to get good quality samples of the metal.

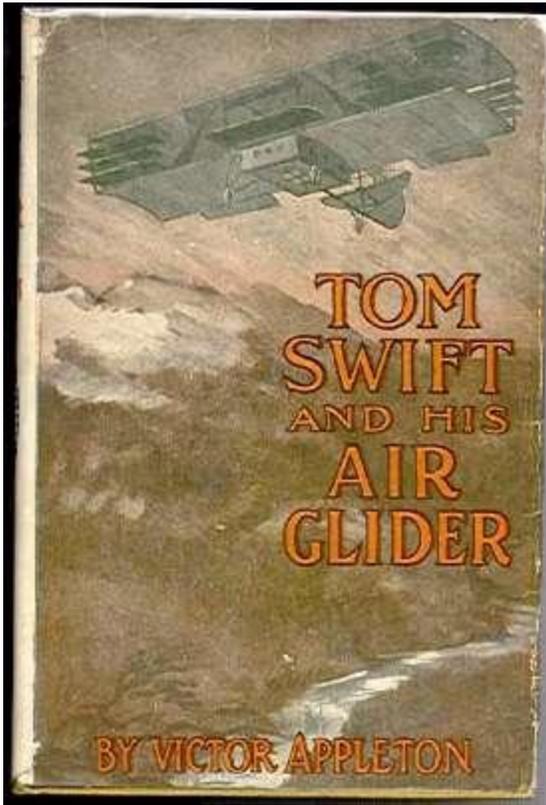
While Tom was wondering what he would do, a Russian who lived nearby came up to him and offered him a quantity of the metal he needed. Upon testing, Tom found that the platinum he had been given was of the highest grade. Excited, Tom asked the man

where he had obtained it. The man told him that it came from a lost platinum mine in Russia that had been discovered when he and his brother (who was exiled in a Russian mine) were lost in the mountains. Later, the Russian authorities recaptured them and discovered the platinum ore samples they carried, but they were unable to find the lost mine.

Tom immediately decided to go to Russia with this man, rescue the man's captive brother, and try to locate the platinum mine. To help their search for the mine (which was located in an area of extremely strong wind), Tom built a glider that used the wind to power the aircraft. With this new air glider stowed away in another aircraft of his, Tom, Mr. Damon, Ned, and the Russian went off to Russia.

Did Tom make it to the mine? Did he rescue the man's brother? All these and more are answered in the book *Tom Swift and his Air Glider*.

Major Inventions



As is the case in many of the old books, Tom did not invent anything new in this book. In fact, he didn't even improve on any existing invention. What he did was this: he needed a machine that could maneuver and even hover in areas of high wind. An existing idea -- the **Air Glider** -- fit the bill. Tom, then, took that existing idea, turned it into reality, and used the invention to hunt for the lost platinum mine.

The air glider worked on relatively simple principles. Ever notice that a strong gust of wind can lift a small wooden glider right off the ground? Well, Tom's Air Glider worked the same way. Tom would roll the plane outside into a windy area, board, and let off the weights. The wind, blowing at high speeds (60-120mph), would literally lift the plane right off the ground. To maneuver the plane, all he had to do was adjust the slant of various wings and weights.

Scientifically, this works just fine. It might take some time to get everything adjusted and learn how to fly such a machine, but there is no reason why a machine like that would not fly. In fact, Tom's Air Glider worked on principles very similar to the hang gliders of today. The only real difference is that the Air Glider depends on winds in

excess of 60mph, while a hang glider encountering such winds would be destroyed. Still, the difference between the hang glider and the Air Glider is mainly related to size and purpose; for all practical purposes they are the same thing.

The book goes into some detail about the construction and operation of an Air Glider. Some of these passages are:

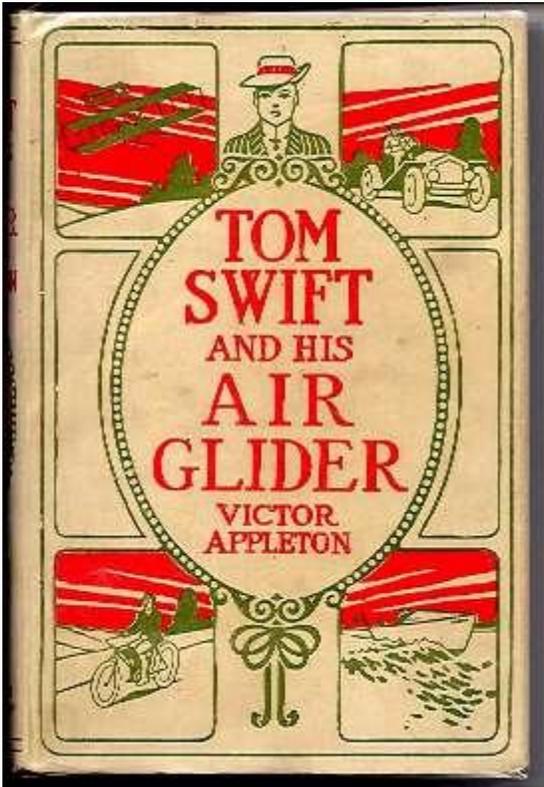
"Lots. I think we're in for a good time." an exciting one, anyhow, if what he says is true. But what in the world is an air glider, Tom?"

"It's the last word in aeroplanes. You don't need a motor to make it go."

"Don't need a motor?"

"No, the wind does it all. It's a sort of aeroplane, but the motion comes from the wind, acting on different planes, and this is accomplished by shifting weights. In it you can stand still in a fierce gale, if you like."

"How, by tying her fast on the ground?"



"No, hovering in the air. It's all done by getting the proper balance. The harder the wind blows the better the air glider works, and that's why I think it will be just the thing for Siberia. I'm going to get right at work on it, and you'll help me; won't you?"

"I sure will. Say, is platinum worth much?"

"Worth much? I should say it was! It's got gold beat now, and the available supply is very small, and it's getting more scarce. Russia has several mines, and the metal is of good quality. I've used some Russian platinum, but the kind Mr. Petrofsky gave me to-day was better than the best I ever had. If we can only find that lost mine we'll be millionaires all right."

...

In brief, the air glider was like an aeroplane save that it had no motor. It was raised by a strong wind blowing against transverse planes, and once aloft was held there by the force of the air currents, just like a box kite is kept

up. To make it progress either with or against the wind, there were horizontal and vertical rudders, and sliding weights, by which the equilibrium could be shifted so as to raise or lower it. While it could not exactly move directly against the wind it could progress in a direction contrary to which the gale was blowing, somewhat as a sailing ship "tacks."

And, as has been explained, the harder the wind blew the better the air glider worked. In fact unless there was a strong gale it would not go up.

"But it will be just what is needed out there in that part of Siberia," declared the exile, "for there the wind is never quiet. Often it blows a regular hurricane."

"That's what we want!" cried Tom. He had made several models of the air glider, changing them as he found out his errors, and at last he had hit on the right shape and size.

Midway of the big glider, on which work was now well started, there was to be an enclosed car for the carrying of passengers, their food and supplies. Tom figured on carrying five or six.

...

"We're certainly going up!" yelled Ned, as he sat beside Tom in the cabin of the air glider.

"That's right!" agreed the young inventor rather proudly, as he grasped two levers, one of which steered the craft, the other being used to shift the weights. "We're going up. I was

pretty sure of that. The next thing is to see if it will remain stationary in the air, and answer the rudder."

"Bless my top knot!" cried Mr. Damon. "You don't mean to tell me you can stand still in a gale of wind, Tom Swift."

"That's exactly what I do mean. You can't do it in an aeroplane, for that depends on motion to keep itself up in the air. But the glider is different. That's one of its specialties, remaining still, and that's why it will be valuable if we ever get to Siberia. We can hover over a certain spot in a gale of wind, and search about below with telescopes for a sign of the lost platinum mine.

"How high are you going up?" demanded Ned, for the air glider was still mounting upward on a slant. If you ever scaled a flat piece of tin, or a stone, you'll remember how it seems to slide up a hill of air, when it was thrown at the right angle. It was just this way with the air glider--it was mounting upward on a slant.

"I'm going up a couple of hundred feet at least," answered Tom, "and higher if the gale-strata is there. I want to give it a good test while I'm at it."

Ned looked down through a heavy plate of glass in the floor of the cabin, and could see Mr. Petrofsky and Eradicate looking up at them.

"Bless my handkerchief!" cried Mr. Damon, when his attention had been called to this. "It's just like an airship."

"Except that we haven't a bit of machinery on board," said Tom. "These weights do everything," and he shifted them forward on the sliding rods, with the effect that the air glider dipped down with a startling lurch.

"We're falling!" cried Ned.

"Not a bit of it," answered Tom. "I only showed you how it worked. By sliding the weights back we go up."

He demonstrated this at once, sending his craft sliding up another hill of air, until it reached an elevation of four hundred feet, as evidenced by the barograph.

"I guess this is high enough," remarked Tom after a bit. "Now to see if she'll stand still."

Slowly he moved the weights along, by means of the compound levers, until the air glider was on an "even keel" so to speak. It was still moving forward, with the wind now, for Tom had warped his wing tips.

"The thing to do," said the young inventor, "is to get it exactly parallel with the wind-strata, so that the gale will blow through the two sets of planes, just as the wind blows through a box kite. Only we have no string to hold us from moving. We have to depend on the equalization of friction on the surfaces of the wings. I wonder if I can do it."

It was a delicate operation, and Tom had not had much experience in that sort of thing, for his other airships and aeroplanes worked on an entirely different principle. But he moved the weights along, inch by inch, and flexed the tips, planes and rudders until finally Ned, who was looking down through the floor window, cried out

"We're stationary!"

"Good!" exclaimed Tom. "Then it's a success."

"And we can go to Siberia?" added Mr. Damon.

"Sure," assented the young inventor. "And if we have luck we'll rescue Mr. Petrofsky's brother, and get a lot of platinum that will be more valuable than gold."

It would not be true to say that the air glider was absolutely stationary. There was a slight forward motion, due to the fact that it was not yet perfected, and also because Tom was not expert enough in handling it.

The friction on the plane surfaces was not equalized, and the gale forced the craft along slightly. But, compared to the terrific power of the wind, the air glider was practically at a standstill, and this was remarkable when one considers the force of the hurricane that was blowing above below and through it.

For actually that was what the hurricane was doing. It was as if an immense box kite was suspended in the air, without a string to hold it from moving, and as though a cabin was placed amidships to hold human beings.

"This sure is great!" cried Ned. "Have you got her in control, Tom?"

"I think so. I'll try and see how she works."

By shifting the weights, changing the balance, and warping the wings, the young inventor sent the craft higher up, made it dip down almost to the earth, and then swoop upward like some great bird. Then he turned it completely about and though he developed no great speed in this test made it progress quarteringly against the wind.

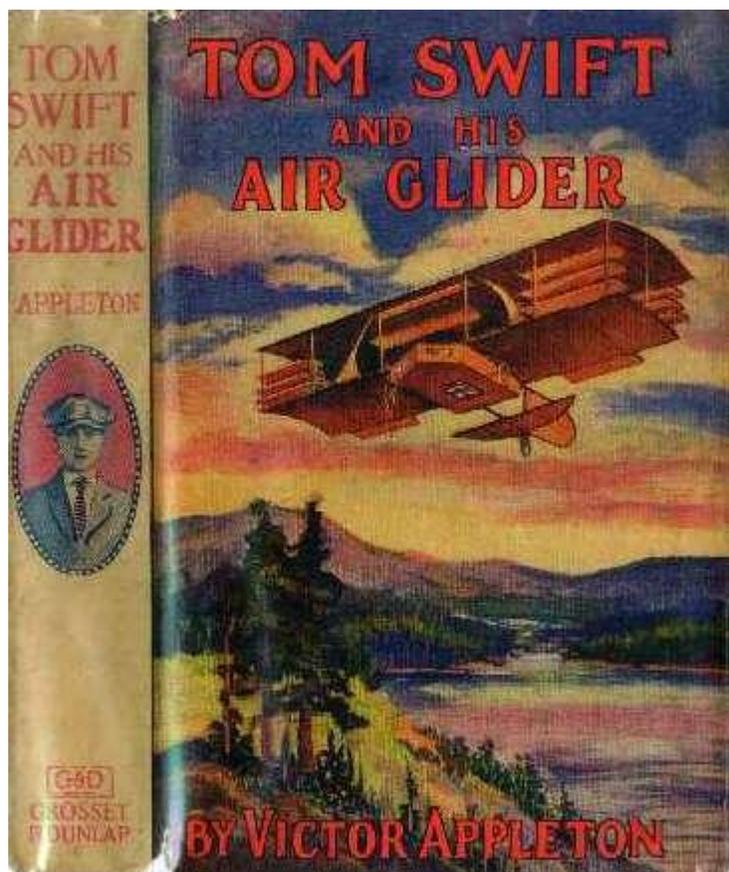
"It's almost perfect," declared Tom. "A few touches and she'll be all right."

#12. Tom Swift and His Air Glider (1912) (Review 2)

or, Seeking the Platinum Treasure

Review by JP Karenko, July 2005, Revised January 2007

Image of a White Quad dustjacket from the collection of Mark Snyder



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

The story opens with Tom flight testing a modified non-dirigible aircraft he is developing. The new/old ship can carry three, and has a modified geared motor, a new propeller and improved wing-tips. None of Tom's cohorts seem happy to accompany him, and Ned finally has to be teased and cajoled into being co-pilot. Ned's foreboding is justified, as the motor quits miles from home. Tom has to make a forced landing in a field next to a remote farmhouse. The Platinum contacts in the plane's magneto have fused due to poor quality metal. As luck has it in these stories, the inhabitant of the farmhouse, one Ivan Petrofsky, is a Russian expatriate who just happens to have a quantity of very pure Platinum, "just lying around." He *gives* it to Tom, who fixes the magneto on the spot. During the social time following the repair, Ivan tells Tom of a mine

in Siberia where the precious metal can be found in abundance. It is in a region of the wilderness where the wind blows with gale force, year 'round. Tom is immediately engaged in a scheme to get more of the metal. Coincidentally, Ivan's brother-a political prisoner of the Czar, is in need of rescue from a Siberian Gulag that happens to be near the mine.

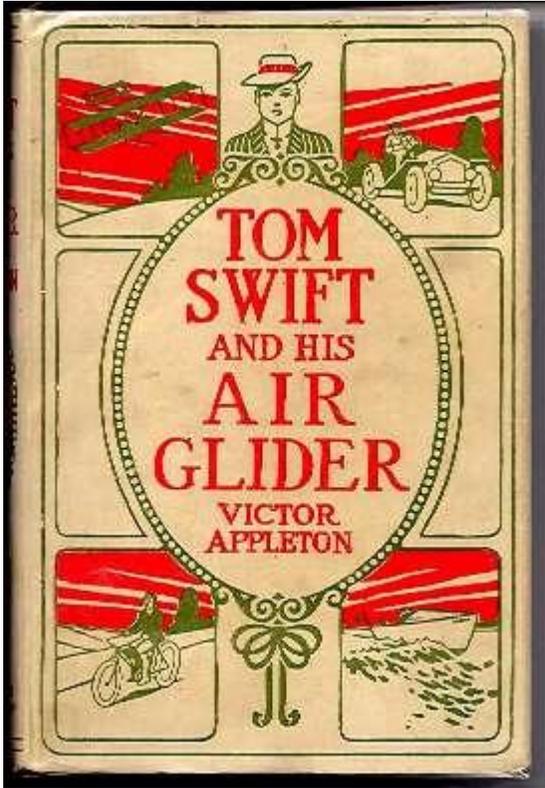
To do all this, a transcontinental capable airship, the *Falcon*, is constructed. This XXL version of the *Red Cloud* is big enough to carry a full complement of adventurers, food, fuel and supplies for 3000 mile hops "in comfort." It also carries an un-powered slope-soaring glider called the *Vulture*, in knocked-down form.

Hazards-foreign and domestic, as well as animal, meteorological and mineral-abound during the ensuing voyage. I'm sure you can guess the outcome, but you'll have to read the story to get the details.

Cast of Characters (More or less in order of appearance)

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. Is a decent cook, too.

Ned Newton--Chum & companion of Tom, currently employed in Shopton 1st National Bank.



Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. In this tome is back in *Waterford*, NY.

Eradicate Sampson, A.K.A. Eradicate or Rad--Rad's middle names, (Andrew Jackson Abraham Lincoln,) are no longer used. Aged stereotypical Negro journeyman jack-of-all-trades. He "eradicates dirt." Now is in full-time residence on the Swift estate, he maintains his own chicken coop. Heavy deep-south accent and Uncle Remus attitude. Caretaker of **Boomerang**, a cantankerous, aged and now ailing, mule.

Ivan Petrofsky--Russian revolutionary expatriate. Tall, bearded (of course...) and cultured. Ex-noble under the Czar. Exiled for working to "improve the lot of the common people."

Peter Petrofsky--No description given. Younger brother of Ivan, imprisoned in Siberian Gulag.

Aged Farmer--Walk-on part. No name or description given.

Jake Applesauer--No description given. Railroad ticket agent in nearby Waterville.

Detective Trivett--NFN or description given. Private Eye, hired to locate kidnapped Ivan. Carries a revolver, but proves to be a lousy shot.

Trio of Terrible Trotskyites--Generic bumbling bearded bad-guy "spies". Think Boris & Natasha from *Rocky the Flying Squirrel*, but taller, bulkier and even more bumbling.

Mrs. Baggert--Housekeeper. Kindly, and "loves Tom like a son." Employed by the Swift family since the time Tom's mother died. She is short of stature and has to stand on a soap box to kiss Tom goodbye on one of his voyages. Excitable, she seems to expect fatalities after any mishap involving Tom's inventions.

Barton Swift--Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. In this episode, apparently recovered from severe medical condition affecting his heart and circulation. Back at work on his new gyroscope.

Andy Foger--Red haired, squinty-eyed bully, who has made great trouble for Tom in the past. In this tome, is smarting from a recent defeat in *City of Gold*. (He didn't get any...) Back to his old tricks.

Mr. Foger--NFN given. Described only as a large man with florid complexion.

Miss Mary Nestor--Love interest of Our Hero. Passing mention, but has been promised a Platinum ring.

Gerard, the Garrulous Gaul--Russian informer/spy/Agent provocateur who tries to get Tom arrested for assault. Dresses roughly, but obviously not a "working man." Speaks with a "strange" French accent.

French Gendarmes--Apparently in league with or employed by the Czar. Try to waylay Tom & Co. during an unscheduled pit-stop in France.

Nicholas Androwsky & His Band of Merry Nihilists--No descriptions given except for "unpronounceable names" and a penchant for tossing bombs around.

Cantankerous Cossack Cavalry--Generic, mounted, sword-waving Russian Rough-Riders.

Officious Russian Governor--Bumbling Bureaucrat. Pompous and ineffective.

Villanous Viktor, A Russian Prison Guard--Usual simpleton. Mean spirited and easily duped.

Nicky the Nihilist, A Russian Prison Guard--*Unusual* simpleton. Good spirited and helpful.

Alexis Borious--Ragged Russian Refugee. Poorly dressed ex-Gulag inhabitant. Knows Ivan's brother.

Prolific Petersburg Peasants--No names or descriptions given. Cast of extras used for local color.

Polite Cossack Officer--No name given. Unusually nice demeanor for an otherwise officious ass.

More Cranky Cossacks--See above.

Officious Siberian Governor--More of the same. Ubiquitous bushy beard. See above.

Major Inventions

Tom Swift "invents" or at least constructs, several major items in this book. In the first part of the story, he is developing a medium-sized but unnamed monoplane. This new/old ship can carry three, and has a newly-rebuilt and modified geared motor, a new propeller and improved wing-tips. The *Falcon*, is an XXL version of the *Red Cloud*. It is of the usual ungainly biplane/dirigible configuration that figures so prominently in these stories. Propulsion is via the usual IC engine/dynamo/electric motor/dual propeller rig. The motor(s) have been "modified" to run on either kerosene or gasoline, via an "attachment." It is big enough to carry a full complement of adventurers, food, fuel and supplies for 3000 mile hops "in comfort." The accommodations include a pilot house/steering tower forward, a living room/dining salon with glass

portals in the floor for observation, a galley, sleeping quarters for 6, and an engine room. It is also presumed that there is a large storage/cargo area to hold provisions, fuel and the main invention of the story. This is an un-powered slope-soaring glider called the *Vulture*-the star of the show, so to speak. This mini-beast can "hover" in a 90mph wind. (See Errata.) Also, a "noiseless" variant of *Falcon* is being planned for a future episode.

Commentary on Society, Attitudes, Environment & Errata

It's amazing how much society and technology have changed in 95 years. Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted, like modern transportation and communications. It also gives me an appreciation as to how much society has changed, too. I wonder what people will be taking for granted 100 years from now, and what they will think of our times, attitudes, and mores (or lack of them)?

Attitudes, Prejudices and Circumstances: Society and attitudes are/were very different at the beginning of the 1900's. African-Americans were heavily stereotyped and were invariably portrayed as poorly educated and speaking a deep-south slave-patois. Denigrating, and what we now call "racist" terms were used feely. Persons living in countries other than America were also described in denigrating terms.

It appears one can land an aeroplane just about anywhere around Shopton without risk or comment. The Nestor family now seems to reside in Shopton. No mention was made of a move from Mansburg, where they were said to live, in earlier tomes. Proximity makes Tom's visits to Mary, easier. Mr. Damon blesses his "**Putty Blower**." A Google search indicates that this is a (usually glass) blowgun "bean shooter." Small pieces of glazier's putty are propelled via a puff of air to annoy various real or perceived enemies. (We used split peas, dried beans or cinnamon dots candy, shot thru soda straws, when I was a kid.) Carriages, while still horse drawn, now sport rubber tires for rider comfort.

Once again, gunfire or display of firearms does not seem to have a deterrent effect on anyone involved.

French police carry swords, rather than clubs or guns.

The Russia of 1912 was already overrun with officialdom. No one dares act without orders or permission. This allows quick-thinking Americans to outwit several Contingents of Cranky Cossack Cavalry.

Speculation As To Author's Identity: Tom has an "attitude" at the beginning of the story that is very much out of character. He is testy and rude, comparing Mr. Damon (a good friend and prime traveling companion before Ned was introduced) to a bag of ballast. Tom & Ned are both very logical and "Hardy Boys-ish," in this tome. Much ado is made of "clews" and logical analysis, which is out of character for them. Methinks maybe "Franklin Dixon" (Leslie McFarlane) wrote this episode. Another mark of the temp ghost writer is that MANY characters are introduced and discarded without so much as mention of a name or a description. It's also one of several in the series that are basically travelogues. While the author was quite familiar with various exotic locations, this story still feels like it was thrown together in a hurry.

Errata: There is a running gag throughout this series. Mr. Damon's home keeps flip-flopping between *Waterfield* and *Waterford*, NY. Sometimes it is in neither, and several times in both places, at once. This is partly due to the enforced poor communication amongst the many ghostwriters at G&D that contributed to this series.

There are now 4 distinct categories. In this tome, Mr. D's home is back in *Waterford*, NY.

The tally for 12 volumes, to date is:

***Waterfield*-6, Both places-1, *Waterford*-3, and No mention-2.**

Typos were rampant. P3 has Tom called masa (massa), p20 has the horros (horrors) of the mines, p62 "He's our (s) now, on p104 Tom takes a (t) rain to Paris, therefor (e) is used, p162 they park the plane on a plane (plain) and p199 has the craft being stanch as opposed to staunch.

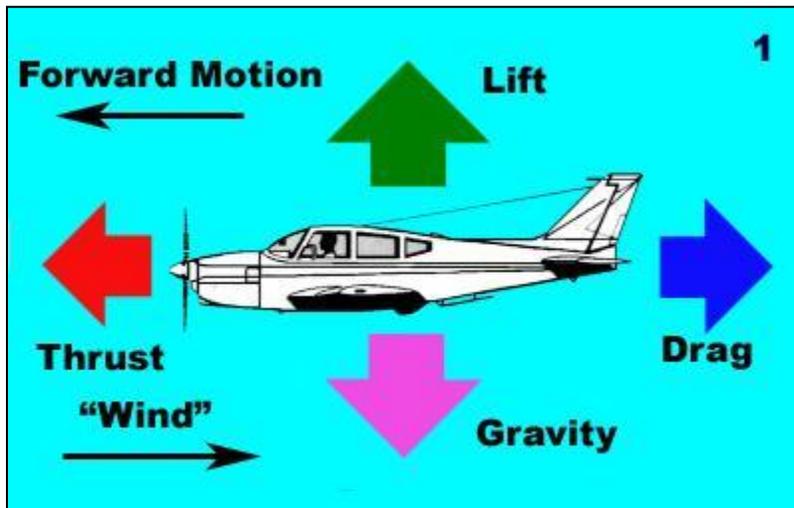
The next story in the series (published as *Tom Swift in Captivity*) is listed as *The Daring Escape From Captivity* on the back of the title page and *The Daring Escape By Airship* in the catalog at the end of the book.

Engineering and Science, Fact vs. Fantasy

The motor(s) of the *Falcon* are said to be able to run on either gasoline as a primary fuel or kerosene, "in a pinch," via an "attachment." Until the advent of the turbine engine (a *few* years into the future,) most engines were either true Diesel or conventional gasoline/spark IC. The change in compression ratio needed to go from gas to kerosene/diesel would be real hard to do in the field. Use of fuel additives to boost the octane of "lighting" kerosene to gasoline's levels, was indeed in use, back then. This could be crudely accomplished by mixing "lamp oil" with 50% mineral turpentine or 20% gasoline. This resulted in a highly dangerous mix called "power kerosene." Running the PK mix was also hard to do, because if the motor cooled down for any reason, (they were in Siberia, remember?) the mix turned the motor into a giant mosquito fogger that soon quit running. The issue of supplying enough fuel volume to the motor(s) was also not addressed. This setup would have had to be rated in "gallons per mile" due to the lower energy content of the hybrid fuel.

The *Vulture* (Air Glider) is said to operate on the same principle as a "box kite without a string." My total experience with kites is that if they get loose from their tethers, it involves saying "bye-bye" and watching them go out of sight-or crash. The author(s) may have seen or heard of slope gliding (as opposed to "vol-planing") aircraft, but it's real obvious they had no clew <sic> as to the physics involved. A simple explanation of slope gliding (what I am sure they were trying to describe) is given, below. Their explanation of hovering in Chapter IX would land them either in a heap, or in a place far, far away.

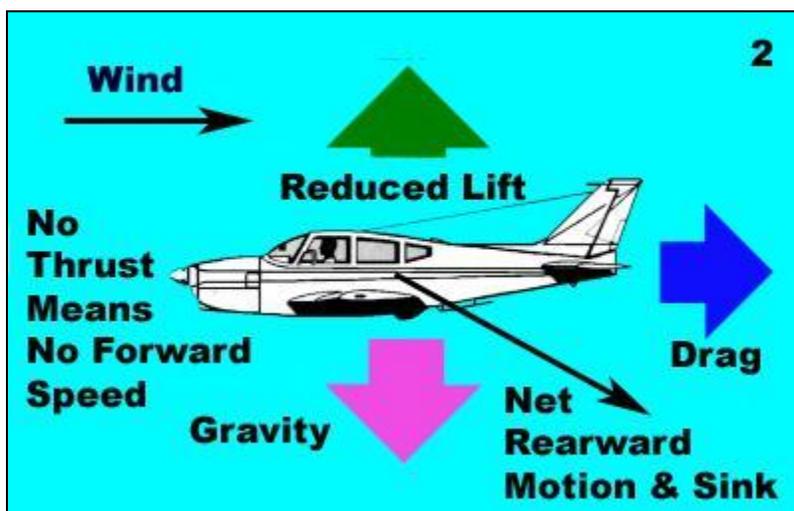
Aerodynamics 101: How can the Air Glider stay stationary or maneuver in mid-air without a motor? When an engineer looks at a problem of forces and motion, the first step is usually to draw a free body diagram (FBD) to represent the object in question. An "aeroplane" <sic> can be represented as a small mass that is subjected to the forces around it. These include thrust, drag, gravity and lift. I had an airplane graphic handy, so I used it instead of a "mass." (See Illustration No.1.)



1. Powered Horizontal Flight

In **powered** *horizontal* flight, air flow essentially comes into the airfoil as flat parallel lines. (Not really, but I'm trying to keep this simple.) Lift is created when the air flows around the airfoil. That air flow is created by the propeller/jet/rocket motor causing a (forward) motion relative to the air around the wing. (An artificial "wind," if you will.) In the absence of a major head wind that exceeds the plane's forward velocity, this is usually accompanied by a coincident motion relative to a ground-based observer. This is NOT in any way, a "hover," which implies a zero relative ground speed.

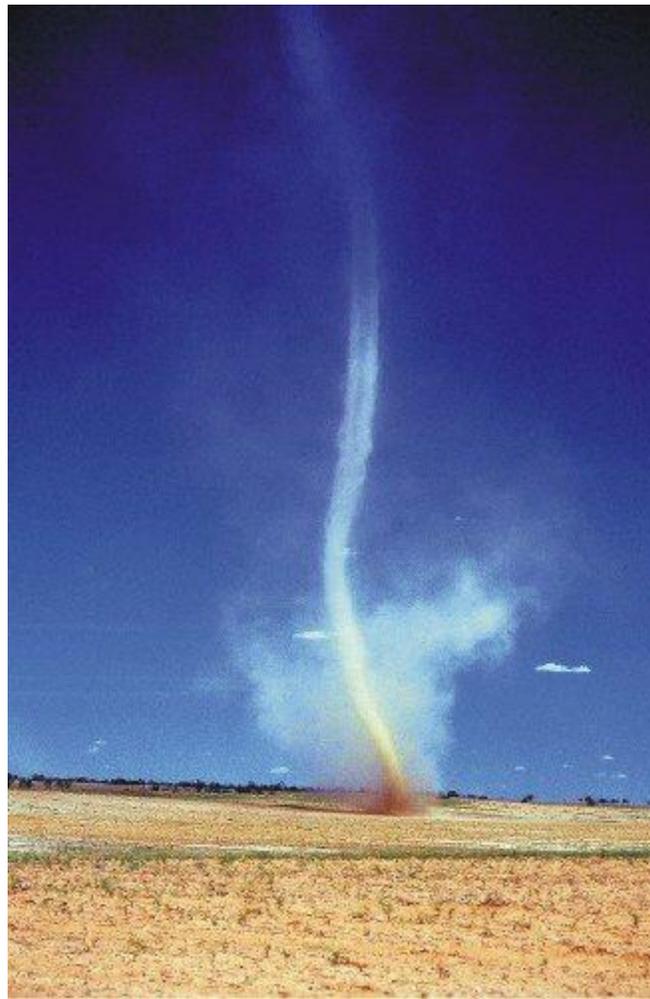
In **un-powered** *horizontal* flight (Motor turned off or not present) thrust is zero. Illustration No. 2 shows three forces on a plane. Since there is no force pulling (or pushing) the plane forward, changing the airfoil (wing) attack angle will only increase drag and yield little or no change in the direction of the lift vector. This means that the forces can't balance each-other out and the craft will move *backwards*, relative to a stationary observer. (Bye-bye Mr. Kite...) It will also always *sink*, since the coefficient of lift over any known wing will always be less than one. Without some forward or reactive force such as a propeller or a "kite string" attached to the ground, I cannot think of a way that in true *horizontal* flow, an aeroplane can glide motionless or hover-regardless of what is done to the CG, as is proposed in the story.



2. Un-Powered Horizontal Flight

The explanation as to why a glider *can* hover, and even move forward without power is WHERE you see such phenomena. The air flow around the glider is NOT completely horizontal, but actually *rising*. This typically happens in only two places: a) In a "thermal"(a rising spiral of air formed by uneven heating of the Earth by the Sun) or b) In "slope effect," found on hillsides and other geographic locations where the elevation of landscape changes abruptly and the wind blows with a favorable velocity and direction. I believe item b) is the situation more-or-less described in the book.

Just to cover all the bases: **Thermals** are the most widespread rising air phenomenon. Basically, there is *at least* one thermal under every one of those puffy Cumulus clouds you see on sunny Summer days. There are also many more that can't be seen, especially in drier climates. Spectacularly visible variants are found in places like the American Southwest, where they can be strong enough to suck the dust off the ground. They create a pencil-thin "Dust Devil" that can end up hundreds or even thousands of feet high and be seen from many miles away. (I speculate that one of these may have been the "Cloudy Pillar" sent by Yaweh to guide the Israelites through the desert during the Exodus from Egypt-but I digress....)

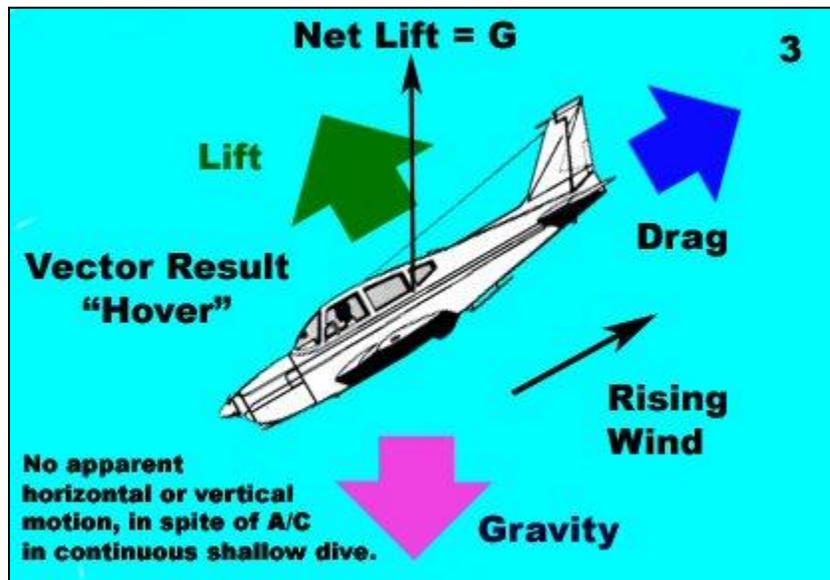


Clear Air "Dust Devil"

Thermals, by definition, are not stationary. They rotate and are displaced by any wind. As a result, any aircraft using them for lift will not "hover," but be carried both upward in a spiral and downwind in the general direction of the prevailing cloud movement. Birds (or gliders) using thermals to remain airborne, typically circle clockwise in the Northern Hemisphere. This is against the usual rotation of the thermal and it maximizes lift. You will note that those birds are in continuous motion relative to the ground. They can rise out of sight without much more than occasionally twitching a wingtip. They do this only to remain inside the rising air column.

It has been my experience (and possibly yours) that you will be very hard pressed to find a bird hovering completely still on very flat land or in the middle of a large lake or ocean. Wind flow tends to be horizontal in these places (except in thermals, as noted, above.) Geography where flatland changes to hilly areas, on the edges of canyons, or edges of lakes where water turns to land create **Slope Lift**. All of these areas are places with significant *updrafts*. A free body diagram of an aeroplane with the wind rising upwards at an angle is shown, below, in Illustration 3. You can see that the lift force is angled forward, the drag is at the same angle as the wind, and gravity splits the two. If lift is great enough *and* at a sufficient angle to offset the drag, the resultant vector between the two forces will cancel out the force of gravity. This leaves a net force of zero on the plane. The aircraft will be stationary with respect to the ground. By varying its angle of attack and/or center of gravity, a glider can balance these forces and stay aloft in a "hover." I believe *this* is what the author(s) were trying to describe.

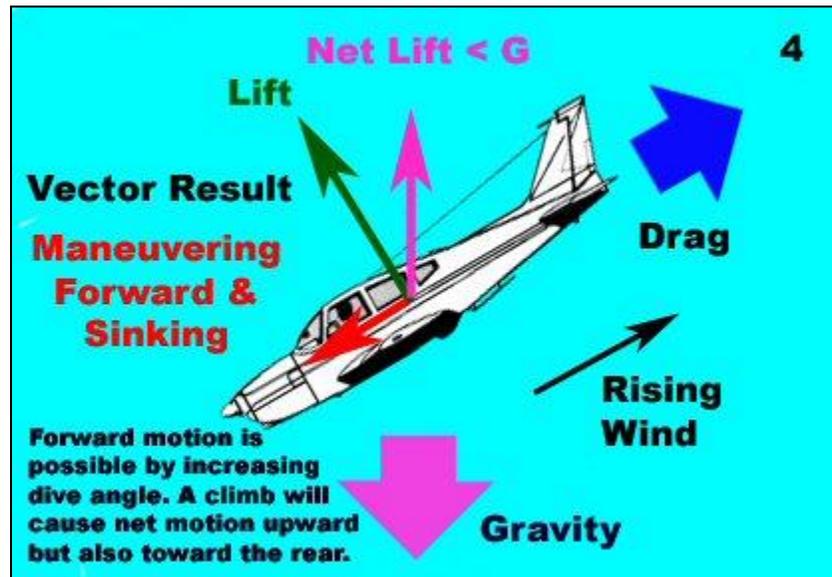
Note that in order to maintain a stable hover, the nose of the plane must be pointed downward at an angle. The plane is actually in a continuous dive, equal in rate to the vertical component of the rising wind. The horizontal component of the vector is equal to the value of drag. No *apparent* forward motion or altitude change is seen. (See Illustration No. 3)



3. Slope Soaring (Hovering)

How can the *Air Glider* move forward or maneuver? Illustration No. 4 shows that instead of the resultant vector of drag and lift being exactly opposite gravity (as in the previous free body diagram), it is pointing slightly forward and downward due to an *increased rate of dive*. The vector components can be shown with a larger force going forward and the other aiding gravity. The increase in dive speed will result in a forward

motion relative to the ground, but the plane will "sink" relative to the ground. If held in this attitude for any length of time, the glider would eventually crash into the slope.



4. Slope Soaring (Maneuvering)

These phenomena only occur in regions of up-drafts (VERY strong ones in the case of the *Vulture*, since it weighs a ton...or more.) Such maneuvering is NOT possible in horizontal un-powered flight, at least near the ground. Without rising air, the *Air Glider/Vulture* could not even take off. Streamlined lightweight birds only need a small updraft to hover. The *Air Glider* needs a massive wind (90mph) because it carries 5 passengers, has massive drag from the biplane configuration, 12 inter-plane winglets, the struts and all the interconnecting stays and wires. Frankly, it would be hard to determine if such an updraft could possibly exist, even in a Siberian gale. The *Vulture* was a real aerodynamic *Turkey*, as described.

Another concern I have is the effect of this Siberian Gale on the *Falcon*. *Falcon* is said to be a "much larger" version of the old *Red Cloud*. *Red Cloud* was never given actual dimensions, but in my review of Volume #8 (*TS in the Caves of Ice*) I made some guesstimates of her size based on a dust jacket illustration. *Red Cloud* was at least 60ft tall by 120ft long across the rigid "gas bag." It had a wing span of at least 240ft. If *Falcon* was indeed a *super-sized* version, it must have been truly gigantic. Flying such a behemoth in a 90 mph wind would surely either shred it to bits or make *Oz* a possible final destination...Anchoring it down in anything but a mild breeze would be near impossible.

Back to reality. Below, is a 1984 snapshot of the author standing just to the right of #1 daughter, Karen, (in the green shorts.) The others are several "flying families." These friends make an annual trek to the Sleeping Bear Dunes National Lakeshore. We toss radio-controlled slope-soaring model gliders into the wind coming off Lake Michigan. The lake is at the upper right, about 700ft below us. This was where I gained practical knowledge about aircraft dynamics during un-powered flight. It's said that you know you had a fun time flying these models when at the end of the day, the roof of your mouth is sunburned. (We spent a LOT of time looking up, usually with mouth hanging open.) How times change-in 2006, my two grandsons, Tony and Joshua, made their first appearances at these sand dunes. Joshua's mom is the redhead in the green shorts and Tony's mom (my youngest daughter, Betty, who is not shown) was a toddler at the time this photo was taken.



Sleeping Bear Dunes - Empire, Michigan

Geography & Environment: Shopton is still a "village" in New York State and there is another new town (Hurdton) nearby. Asbury Park and Sandy Hook, NJ, are noted as "desolate country." (These areas are now all prime seaside resort property.)

It appears that the author was at least semi-acquainted with world geography, and possibly had personal experience as a world traveler, due to the "travelogue-ish" feel of the story. The route of *Falcon*, as described was roundabout, but semi-logical. A 5-day Atlantic crossing via a non great circle route (‘round the Azores and near the location of the future *Floating Airport*) to France, meant the *Falcon* had a cruise speed of about 33mph. Impressive for something that large with only one motor. Known Russian landmarks were quoted as waypoints.

JP Karenko 7/10/05 revised 1/07

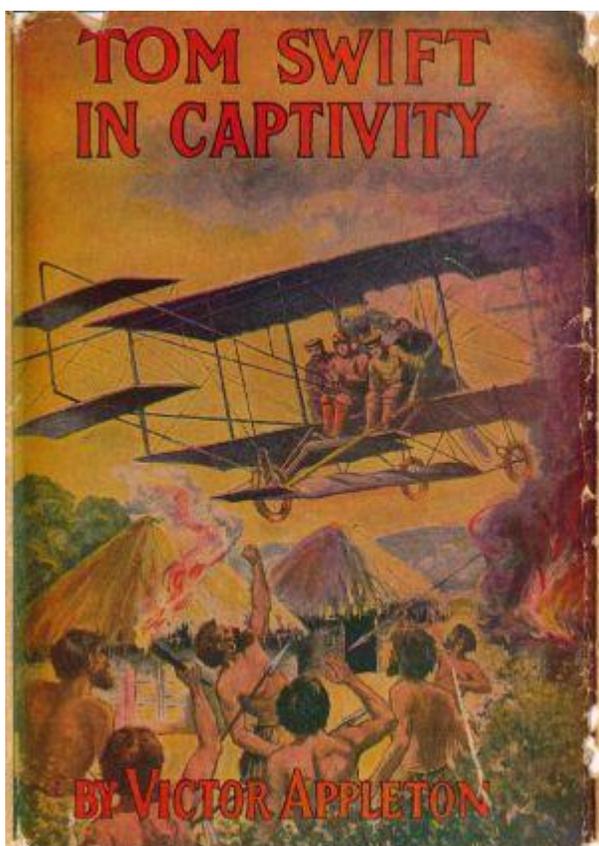
#13. Tom Swift In Captivity (1912)

*or, A Daring Escape by Airship
~ Alternate Titles ~
Tom Swift in Giant Land
or, A Daring Escape From Captivity*

Review by JP Karenko, June 2005

Image of a White Quad and Duotone dustjacket courtesy of Mark Snyder

Full-color image courtesy of Carl Swanstorm



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

The story opens with Tom complaining that life lacks adventure. It's been a while since they returned from Siberia, and a fresh Adrenaline fix is needed to take the edge off sitting around and reading books about faraway places. Tom wants to "go off in the jungle, fight wild beasts and escape from wild savages, all in the name of good fun." Tom's cravings are solved by the appearance of one Sam Preston, the owner of a large circus, who needs a new attraction for his side show. He has been informed of a place in the jungles of South America where a race of giants live. Sam's show "must have such a creature," and Tom is offered a princely sum to go procure one or two. Coincidentally, the fellow previously sent on this quest by Preston has gone missing. Tom is tasked with either bringing him home or giving his remains a proper burial.

To add insult to other natural hazards, a competitor in a rival circus, sics a generic bad-guy on Tom. He is to try and foil the plan and beat Our Hero to the prize. This guy is *so* bad, he is a wolf in priest's clothing.

You can probably guess the outcome, but you'll have to read the story to be sure.

Cast of Characters (More or less in order of appearance)

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home--schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. Is a decent cook, too.

Ned Newton--Chum & companion of Tom. Apparently employed in Shopton 1st National Bank, but lately never seems to have to show up for work, as he is now a regular fixture in Tom's adventures.



Eradicate Sampson, A.K.A. Eradicate or Rad--Rad's middle names, (Andrew Jackson Abraham Lincoln,) are no longer used. Aged stereotypical Negro journeyman jack--of--all--trades. "Eradicates dirt." Now is in full-time residence on the Swift estate, and maintains his own chicken coop. Heavy deep--south accent and Uncle Remus attitude. Caretaker of **Boomerang**, a cantankerous, aged and now ailing, mule. **Mr. Wakefield Damon**--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person.

Dr. Perkinby--NFN or description, other than as Barton Swift's doctor.

Mrs. Baggert--Housekeeper. Kindly, and "loves Tom like a son." Employed by the Swift family since the time Tom's mother died. She is short of stature and has to stand on a soap box to kiss Tom goodbye on one of his voyages. Excitable, she seems to expect fatalities after any mishap involving Tom's inventions.

Sam Preston--Owner/operator of a large circus. Ex-acrobat, small of stature, but still spry. Has a dark complexion, "black" eyes, and a moustache. Sports a white hat, loud checkered suit,

red vest and a thick watch chain. Could he be Spike Jones' daddy???

Jake Poddington--No description given. Great White Hunter employed by Sam Preston, now MIA in the jungle for most of a year.

Zacatas--NFN or description given. Native straw boss on Jake Poddington's expedition.

Barton Swift--Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. In this episode, apparently recovered from severe medical condition affecting his heart and circulation, but is starting to show his age. Still at work on that gyroscope.

Wayland Waydell--Rival of Sam Preston. Suspected of complicity in the disappearance of Jake Poddington.

Mrs. Damon--NFN or description. Wakefield's long-suffering wife. Spends a lot of time at her mother's house while Mr. D is off gallivanting. Hates aeroplanes and is said to henpeck Mr. D, but he always seems to get his way when it comes to traveling with Tom. Described as "easily fooled" by Mr.D. (Yeh, like a fox...)

Andy Fogger--Red haired, squinty-eyed bully, who has made great trouble for Tom in the past. In this tome, has lost the spark of goodness and remorse for past transgressions that was kindled when Tom saved his life in *Electric Rifle*. Back to his old tricks, he is hired by bad-guy Wayland Wendell to spy on Tom and get details of the trip to South America.

Miss Mary Nestor--Love interest of Our Hero. Passing mention only in this tome.

Rev. Josiah Blinderpool--Alleged Protestant Missionary to the natives of South America. In reality, a card-playing, cigar-smoking baddie named **Hank Delby**, in the employ of Wayland Waydell.

Captain of SS Calaban--No name or description given.

Mameld--NFN or description. Mate of SS Calaban.

Mr. Simm--NFN or description. Crewman on SS Calaban.

San Pedro--NFN or description. Straw boss hired by Tom for overland jungle trek.

The Treacherous Half-Breed--NFN given. Yellow skin and sporting a large revolver. Hank Delby in yet another disguise.

Antonia, Selka and Balaka--No last names or descriptions. Native porters.

Chief of Unnamed Village--No name or description given, except as wearing home-spun clothes.

Oom--Giant scout for his tribe. "Twice the size of an ordinary man." Tawney hair, bushy beard, and very white teeth. Not less than eight feet tall in bare feet. Complexion "almost white." Not skinny, but "well proportioned." Estimated to weigh about 400 pounds. Booming voice and appetite to match. Loves sweetened coffee.

Kosk--King of the giants. Simple and clean. Tallest of the tribe, at about 10 feet tall.

Koku--One of two twin brothers to King Kosk. Nine feet tall.

Tola--The other of two twin brothers to King Kosk. Nine feet tall.

King Kosk's Son--No name or description given, except "short" at 7 feet tall.

Major Inventions

Tom Swift does "invent" several somethings *for*, but not *in* this book. Only one of the devices plays any significant part in the story line. The rest are stage props. A small 2-seat airplane, the *Lark*, becomes important. Already fully developed and tested, it may be a successor to the *Humming Bird*, Tom's original *Sky Racer*. (Book #9) The *Lark* seems to have the usual characteristic of all Swift-designed craft—an ability to lift stupendous payloads without apparent physical means. Said to hold **two** passengers, it is able to lift **five** in a pinch. A larger 4-seat aircraft, the *Scooter*, is only mentioned as an aside. Finally, the "noiseless airship" which will play a central role two volumes into the future, is under development. The airframe is that of the *Falcon*, Tom's XXL dirigible/biplane design custom built for a cross-country trip to Siberia in the previous volume, *Tom Swift and His Air Glider*. The "noiseless" part has to do with a new propulsion system, that is not detailed, yet.

Commentary on Society, Attitudes, Environment & Errata

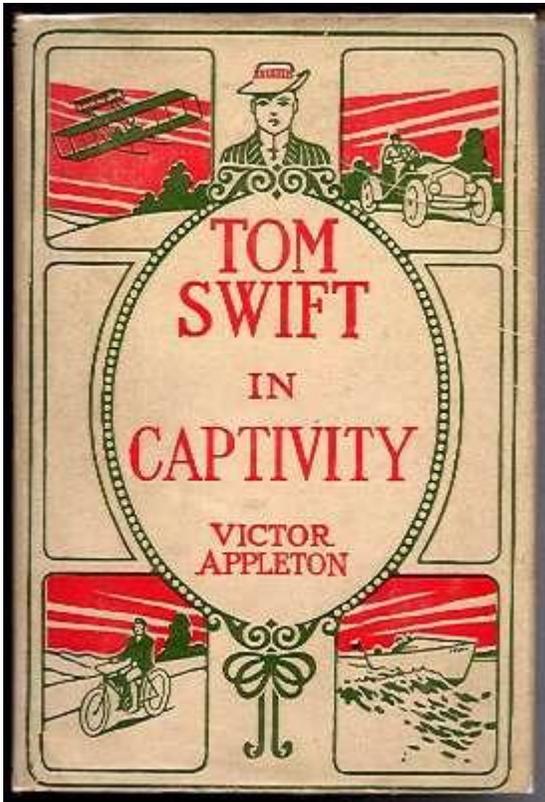
It's amazing how much things have changed in 95 years. Reading the old Tom Swift Sr. series has really given me an appreciation for the gadgets that I've come to take for granted, like modern transportation, communications, satellite mapping and *air-conditioning!* It also gives me an appreciation as to how much society has changed, too. In this story, there are significant social issues having to do with going to foreign lands and bringing back human inhabitants for monetary gain. I wonder what people will be taking for granted 100 years from now, and what they will think of *our* times, mores and attitudes?

Attitudes, Prejudices and Circumstances

slav...er...y (slā'və-rē, slāv'rē) *n., pl. -ies*. Slavery is an institution based on a relationship of dominance and submission, whereby one person owns another and can exact from that person labor or other services.

At first, I felt that Koku and Tola were, for all intent being brought to America as slaves. One giant was to end up in a circus "for exhibition." The other, Koku, was to spend his life acting as bodyguard and servant to Tom. Both were contracted to be brought to the US "in good condition—as the *animal* people say." They are referred-to strictly as "specimens," a commodity—not as human beings. Tom gets paid \$10,000 to "capture" these fellows. Reconsidering, maybe the term slavery is a bit harsh. Tola and Koku *are* being compensated for their new careers, and they truly weren't "captured." Kidnapping? Think of "capturing" a 9-foot, 400# Arnold Schwarzenegger, who didn't want to come with you....times two. They came willingly, but I suppose with some regrets. Oh well, I suppose life in the US was an improvement. They still both had to work for a living, but being a servant where there are clean sheets and 3 good meals a day (without having to hunt) must have been some incentive to come along. Of course, having Tom as a master sounds better than serving your older brother, who is a king and has the power of life or death over you at a whim.

The standard prejudices demonstrated in previous volumes, still prevail. America is still top dog-"We are citizens of the US. We don't kneel to anybody!" quotes Tom. South Americans are called "queer" and "only nice when treated well-bad, if not." "A white man," it is said, "will not get suddenly friendly with the black race unless for some selfish purpose." Rad gets to carry a shotgun for protection in the jungle. Previously, he was said to be untrustworthy with a gun. Inconsistent, as he had a revolver in *City of Gold*. Natives, usually at the bottom of the food chain, get treated a bit more humanely, in this tale. Warring tribesmen would be treated to a "stun" dosage of *Electric Rifle* fire, if they attack. This was to avoid being "needlessly cruel."



Errata: Mr. Damon is back in *Waterfield*, NY. The current score of his many moves between there and *Waterford* stands at 8-*Waterfield*, 2-not recorded, and 5-*Waterford*, for 13 volumes, to date. The numbers don't total, because two volumes have him residing in *both* places at once.

Typos and inconsistencies were pretty common in this volume. On p2, Tom and Ned have fut (fun), on p78 they hire burro(w)s, on p198 giants develop(e), and on p209, the crew fire a slavo (salvo) of small arms. Early in the story, Mr. Damon is back to being "stout and waddling." In the previous tale he seemed spry enough. On p6 Rad is said to "start" an already running aeroplane motor. Later, the *Electric Rifle* is said to store a charge of 5000v of magnetism, rather than electricity. On p108, the *ER's* are used at *full charge* to kill a Boa Constrictor having an intimate dinner engagement with Mr. Damon. The charges, which in previous stories have disintegrated no less than whales, kill the snake and leave Mr. D untouched. When Jake Poddington is rescued after a year of captivity, he is described as "thin, pale and thirsty." This, in spite of being "given good food and treated well." The giants' great size and strength is attributed to diet and "favorable conditions" in the land where they live. Rad

fires a "double load" from his shotgun. The authors may have meant "both barrels," or it might have been a black powder muzzle-loader. (Unlikely, as everyone else used more modern cartridge weapons.) Mr. Preston, the ex-acrobat, was said to have done a "double somersault over 15 elephants." Now, *that's* a leap of faith...

Engineering and Science, Fact vs. Fantasy: Aside from the speculation that diet and good weather causes (healthy) giant-ism, my only major gripe about the science in this tome has to do with the getaway plane.

The *Lark* is described as "small and speedy" and seating two. "Speedy" planes have lousy load-carrying ability for the same reason that "heavy lifters" will not go fast. (--at least, not on 40hp.) The wings are differently shaped and sized for the two mutually exclusive tasks. The illustration on the frontpiece

opposite the title page, shows a "Curtiss Pusher" type *single seat* aircraft carrying five passengers *sitting where the engine would be* on the real plane. With an approximate 38 foot span, and being generous, I'd say that the two wings had a lifting area of 300 square feet. (That's *real* generous.) This 1400lb (empty) underpowered (40hp) kite had to lift five adults (4 at 150lbs each plus "stout" Mr. D at 250lbs), fuel (50lbs-that's only 10 gallons) and camping gear/weapons/etc. (another 150lbs.) It had to do so with a short takeoff run over uneven ground with lots of PO'd giants trying to poke holes in it and the occupants. Massaging the numbers above gives us an all-up weight of 2450lbs, loaded and a wing loading of a bit over 8lbs per square foot (psf). Not bad for today's general aviation aircraft (20lbs psf is typical) but keep in mind this little beast only had 40 horses trying to haul all those bodies off *terra firma*, and the frontal area of those bodies, luggage, struts and wires would make the *Lark* about as aerodynamic as a barn door.

Curtiss Pusher -- Wingspan 38 ft 1 in Length 25 ft 6 in Height 9 ft Weight 1,390 lb (empty)



Photo courtesy of the Smithsonian collection.

Geography & Environment: The geography as described, while mostly fictional, was reasonably accurate. At least one of the G&D staff had been somewhere near Argentina.

The only item that was hard to believe about the environment was the native battles involving "thousands" of tribesmen. Los Indios in the interior generally live in smaller family or clan sized groups, not "nations" of thousand warrior-strong members.

JP Karenko 7/10/05

#14. Tom Swift and His Wizard Camera (1912)

or, Thrilling Adventures While Taking Moving Pictures

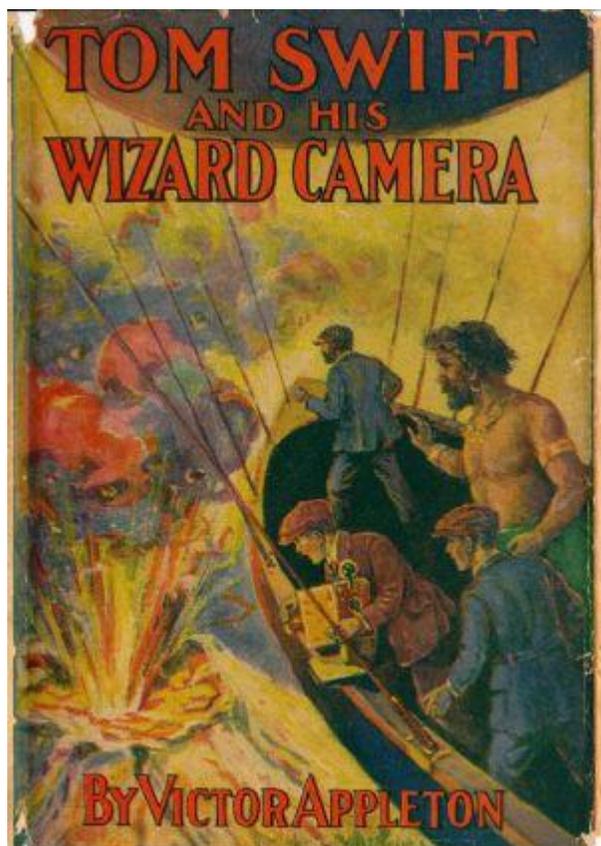
~ Alternate Titles ~

*Tom Swift and His Electric Camera¹
or, The Perils of Moving Picture Taking²*

Review by JP Karenko, June 2005

Full-color image courtesy of Carl Swanstrom

Image of a White Quad and Duotone dustjacket is courtesy of Mark Snyder



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

The story opens with Tom bored out of his mind. It's been 6 months since his *Escape From Captivity*, and working on his noiseless airship motor pales in comparison. He is introduced to a "moving picture promoter," one James "Spotty" (Wait!-I know what you are thinking-says he) Period. This portly gentleman, who has the annoying verbal habit of interrupting even himself engages Tom to build a revolutionary electric powered motion picture camera. Tom is then tasked with cruising the world, playing Paparazzi. Mr. Period is in need of spectacular newsreel films to show in theaters, both as filler and for travelogues. Mr. Amos Nestor, Mary's father, is a prime stockholder in Period's company, and Tom takes on the challenge, not just for the money, but as a chance to bond with the man who may become his future father-in-law.

The camera is designed in a week, built in 3 more and "perfected" shortly thereafter. (Sigh, such efficiency!) Tom also builds from scratch, a new super-sized airship, the *Flyer*, along the same impractical lines as his previous biplane/dirigible creations, *Red Cloud*, *Black Hawk* and *Falcon*. This one has all the usual luxuries, plus a pressurized cabin, transcontinental range, a machine shop (including a forge)-and a darkroom. Considering *Falcon* already had transcontinental capability, this one must be a monster in size.

Danger-animal, mineral, vegetable and meteorological-lies everywhere. Tom gets it *all* on film.

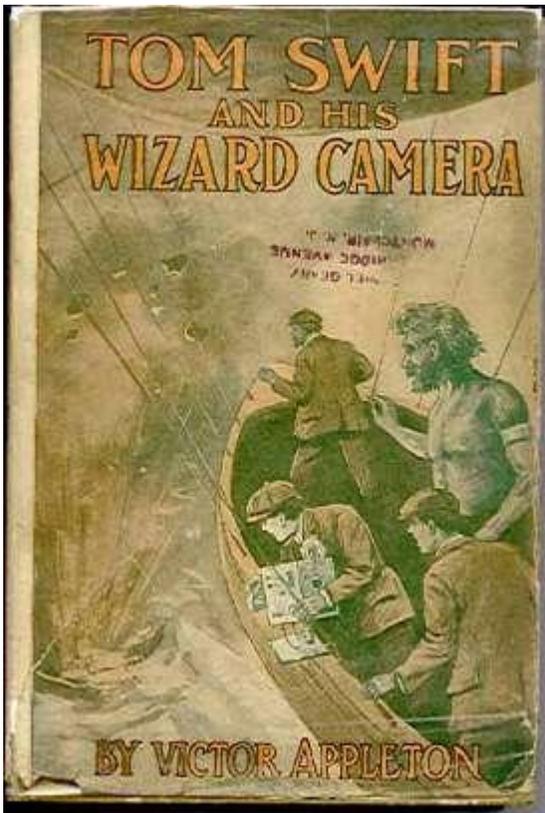
You can probably guess the outcome, but you'll have to read the story (or go to a theater) to be sure.

¹ p218 Closing text *Tom Swift in Captivity*

² p219 Advertising flyleaf *Tom Swift in Captivity*

Cast of Characters (More or less in order of appearance)

Koku or August--Eight foot plus native giant purloined from the South American jungles in Book #13. Now in the employ of Tom Swift as a bodyguard, manservant, and devoted companion. He has learned English well, except for a propensity to sound a bit like Yoda from *Star Wars*. Much is made of his name change to August. Except for the initial to-do, he is always referred to as "Koku," his original name. Competently pilots the *Flyer*, and is given his very own *Electric Rifle*, after saving Tom's life.



Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home--schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. Is a decent cook, too. In this episode, he shows a reckless streak that is near suicidal. When he gets a camera in his hands, his brain shuts down and common sense flies away.

James ("Spotty" or "Jim") Period-- Short, stout, fussy individual with a spit-on-the-griddle energy that drives everyone around him to distraction. Repeats himself endlessly, even to interrupting himself in the middle of his own sentences. Preoccupied with how much money he is losing by taking the time converse. Would do well to say things once and move on, or use a telephone instead of traveling so much.'

Ned Newton--So far, has never been described. Chum & companion of Tom, Apparently no longer employed at Shopton National Bank.(Probably fired for spending so much time gallivanting around the world.) He is now a regular fixture in Tom's adventures.

Mrs. Baggert--Housekeeper & mother figure. Kindly, and "loves Tom like a son." Employed by the Swift family since the time Tom's mother died. She is short of stature and has to stand on a soap box to kiss Tom goodbye on one of his voyages. Excitable, she seems to expect fatalities after any mishap involving Tom's inventions.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. Apparently no longer overweight and sickly, as originally described. Has not crashed any vehicles, lately, either-He has had issues with keeping mechanical contrivances and even horses, under control.

Barton Swift--Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. In this episode, described as having aged greatly, probably due to Tom's extended absence while captive. Still at work on a new gyroscope device.

Eradicate Sampson, A.K.A. Eradicate or Rad--Rad's middle names, (Andrew Jackson Abraham Lincoln,) are no longer used. Aged stereotypical Negro journeyman jack--of--all--trades. "Eradicates dirt." Now is in full-time residence on the Swift estate, and maintains his own chicken coop. Heavy deep--south accent and Uncle Remus attitude. Caretaker of **Boomerang**, a cantankerous, aged and now ailing, mule.

Rad is now described as feeble, aged and tottering, too old to go on adventures with Tom any longer. This causes him much distress, as rival Koku drops into the empty spot in Tom's crew.

Male Prowler--No name or description. Appears to have set a deadfall trap for Tom, in his workshop.

Unnamed Town Doctor--Ministers to Tom after he is overcome by noxious gas in his shop.

Wilson Turbot--No description given. Rival of James Period. Tries to hire away Tom, and buy his camera. Sabotages Tom's efforts when refused.

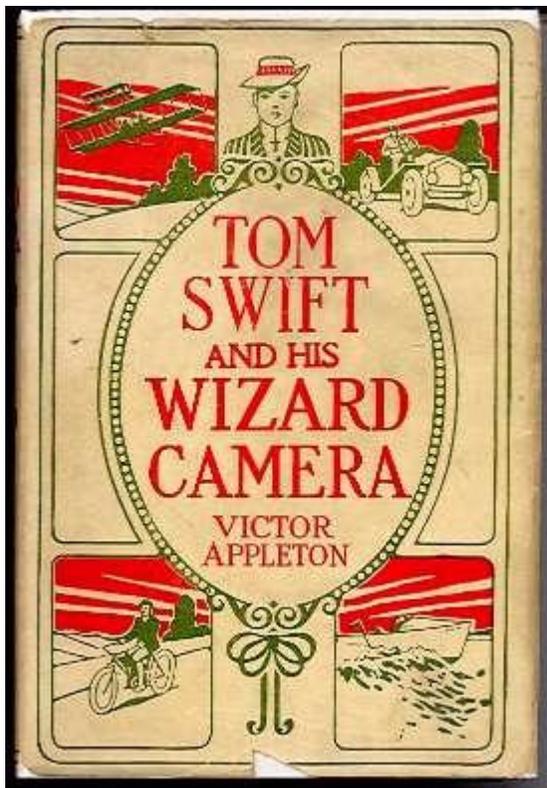
William Eckert--No description given. 2nd Rival of James Period. In league with Turbot, above.

Samuel Rastus Washington Jackson Johnson--No description given, except as 2nd cousin to Rad. Caught on film "counting Rad's chickens" after dark, during a test of the Wizard Camera. Chased off the property.

Mr. (Amos) Nestor--No description, other than as Mary's father. First name never mentioned in this story, even though he is a principal character. Mrs. Nestor doesn't even rate a mention.

Miss Mary Nestor--Love interest of Our Hero. Passing mention only in this tome.

Crew & Officers of SS *Belchar*--Passing mention only. No descriptions given.



Famous Paranoid Millionaire--Passenger on *SS Belchar*. No description given. Wants to hire away Koku as a bodyguard.

Calcutta Agent of Mr. Period--No description given. Passing mention.

Mr. & Mrs. Janeway--No descriptions or first names given. Christian missionary friends of Illingways. Run a Congo mission station, near Stanley Falls.

Bruce Montgomery--British agent of Turbot & Eckert. Burgles Tom's camera, late in story.

Wade Kenneth--British agent of Turbot & Eckert. In league with Montgomery, above.

US Consul, Lima Peru--No name or description. Passing mention.

Major Inventions

Tom Swift starts this tale working on parts to his "noiseless airship," (the *Falcon* with a modified power-plant) which will be utilized in the next volume. He also invents the Wizard Electric Powered Moving Picture Camera. It is revolutionary, in that it is small, lightweight and does not have to be cranked by hand. Current technology cameras of that day were muscle powered. The WC has an on-board electric light so that pictures may be taken after dark, and can be set to run either on a timer or by a hard-wired remote control. Power is provided either by a storage battery or external power provided by a dynamo. It is a small square box with the lens (and presumably the light) on the front. Another feature is the ability to change films in daylight without using the usual "dark bag" and a window that allows the operator to see how much film remains for use. (My father's 1950 Kodak 8mm movie camera had to have film changed in shade or near-darkness and still showed streaks from light leakage if the film was not handled carefully.)

Originally mounted vertically in the floor of Tom's airship, a series of reflectors is built as an accessory that allows the camera to be pointed horizontally while in flight "for better views." In spite of the small size, film reels lasted a long time. 40 years later, my Dad's 8mm had a run time of about 7 minutes. The film was actually 16mm wide and was only exposed down half its' width. At the end of the roll, the film was removed, flipped over and the other half exposed. Much editing and splicing ensued to make home-movie watching practical. Tom's magic box did not have such limitations.

The *Flyer* was also custom built just for the trip. It is now pressurized for high altitude travel, and has a darkroom on board as well as the usual De Luxe accommodations. Anyone who has read any of the previous stories knows about these behemoth floating Rube Goldberg airships. Parking space at the Swift's house must be getting tight. Tom now has at least 4 dirigible/biplanes, plus the *Scooter*, *Lark*, *Butterfly* and *Vulture* Air Glider.

Commentary on Society, Attitudes, Environment & Errata

It's amazing how much technology has changed in 95 years. Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted. Modern transportation, Hollywood motion pictures, movie SFX and my little Sony digital Handycam are a few. I wonder what people will be taking for granted 100 years from now, and what they will think of *our* times, mores and attitudes?

Attitudes, Prejudices and Circumstances: When Tom gets a camera in his hands, concern and common sense fly out the window. To get "interesting scenes" of elephants, he flies the monster airship over a herd of pachyderms. This of course spooks them, prompting a stampede. Folks on the ground, now in danger of life and limb, are righteously upset. Tom just shrugs it off as the cost of doing business. Later, we see him on the slopes of an erupting volcano, shooting away while the ground opens at his feet. Sigh, the immortality of youth! The usual prejudices abound, with Englishmen being referred to as "strange," and native peoples being called "black beggars." Koku, on the other hand has moved up the food chain, a bit. He rescues Tom several times, and when it is determined that he is a crack shot with a rifle, Tom gives him his very own Electric Rifle to keep, in gratitude. It is the only one ever to be given away, even to Ned or Mr. Damon (neither of which handles a gun very well, in my opinion.)

On p36 Tom & Ned chase a burglar "pantingly." This is the first usage of what will eventually become the short-lived craze of the late 60's, "Tom Swifties." On p88 the sailors on a commercial steamship sound like a bunch of Hollywood pirates peppering their conversation with "shiver me timbers," et cetera.

Errata: Mr. Damon is left in *Waterfield*, NY, for this volume. The current score of his many moves between there and *Waterford* stands at 9-Waterfield, 2-not recorded, and 5-Waterford for 14 volumes, to date. The numbers don't total, because two volumes have him residing in *both* places at the same time.

Typos were few and far between. On p45, a chat (chap) is referred to, on p76, they develop films, on p78 happening only has one 'p', and on p189 the foamy rock coming from the volcano as two 'm's, pummece.

Tom is said to film tigers in the Congo Free Republic. Lately, some of the cats have been relocated to Africa to try and save them from extinction, (mainly further south) but in those days, it just proved that office dwellers should do better research, especially for boy's adventure books.

Engineering and Science, Fact vs. Fantasy: I spend a lot of time piddling on the design of Tom's airships. The *Flyer* is no exception. It is a super-sized version of previous dirigible/biplane hybrids, and in addition to the usual leaky gas bag filled with explosive lifting gas, it now sports a pressurized oxygen-enriched cabin. The author(s) must have been called to task about anoxia while flying over places like the Himalayas and Alps! In any case, this monster gets down and dirty around an erupting volcano, and in a real world, Tom would be a Crispy Critter or a Sizzling Swift Sausage. Another feature of this new machine is its' notorious unreliability. It breaks down several times in the most inconvenient times and places, making the occupants scramble to keep from being burned, buried or eaten.

Tom works on a "new sort of electricity" early in the story. I'll assume the authors meant "electric storage cell," as acid is being used during this part of the tale. Tom is not said to have *any* protective gear-gloves, goggles or even an apron-and gets an acid burn on his hand. My old Chemistry instructor would have had him in detention and banned from the lab for such careless behavior. As it is, he ends up overcome by fumes, but makes the usual miraculous recovery with no lasting ill effects. In today's world, the publisher would probably get sued for promoting unsafe experimental practices by inventor-wannabe readers.

Camera Tech: When the movie 2001 A Space Odyssey came out in 1968, (almost 40 years ago!) I was 2 years into engineering college and was totally enthralled with the advanced hardware being casually shown "in everyday use." The tablet computers (my Palm Pilot is smaller-Nyah nyah) and the micro-sized video cams were most impressive to me. These were the days when a "portable" (video) camera was a shoebox sized monster and the associated recorder was "bigger than a breadbox," and a lot heavier. The camera shown in the film (see below) was near magic. My 2001 Sony Digital Handycam is the realization of that "science fiction." It is a bit more bulky than the device shown in the movie, (see clip, below) but my camera's tech is already 3 years old and newer machines (not to mention video capture cell phones!) are much smaller. Tom Swift would have drooled at the chance to take one of these on his expeditions.



2001 Cam (SFX)



2001 Cam (Reality)

Tom's "competition" at the time of this story, probably used a camera similar to this 1908 Pathe Pro hand cranked model. It was heavy, bulky and not real reliable.



The 1924 (12 years into Tom's future) Kodak Cine A was considered to be one of the **very first** *electric powered* cameras. Note the hand crank on the side "just in case."



Tom's Wizard Camera was truly ahead of its time. Where the fantasy part of this device comes in, is that it was designed in one week, built in three and perfected (except for the innumerable "adjustments") in another four. The optics, special sprockets, gears and internal parts would have been hard to come by, even for a miracle worker like Tom in such a short time. It also used a "special type of film." My opinion of all this progress for one man working alone? Balderdash.

Geography & Environment: Shopton is now a "town." It had been described as a "sleepy village."

Tom's workshop is now huge and has a "front office." Something that bothers me a bit is the "part of his submarine" hanging from the roof of the shop. Not sure I'd want to spend any time under that much mass.

Tom & Co. are now true world travelers. They start in New York, cruise to Calcutta, India, and see the Durbar. They then fly to the Punjab to see elephants and tigers. The next hop is to Berne, Switzerland for an avalanche. >From there, they fly to Congo, to record a tribal war and more animals, and then hop back

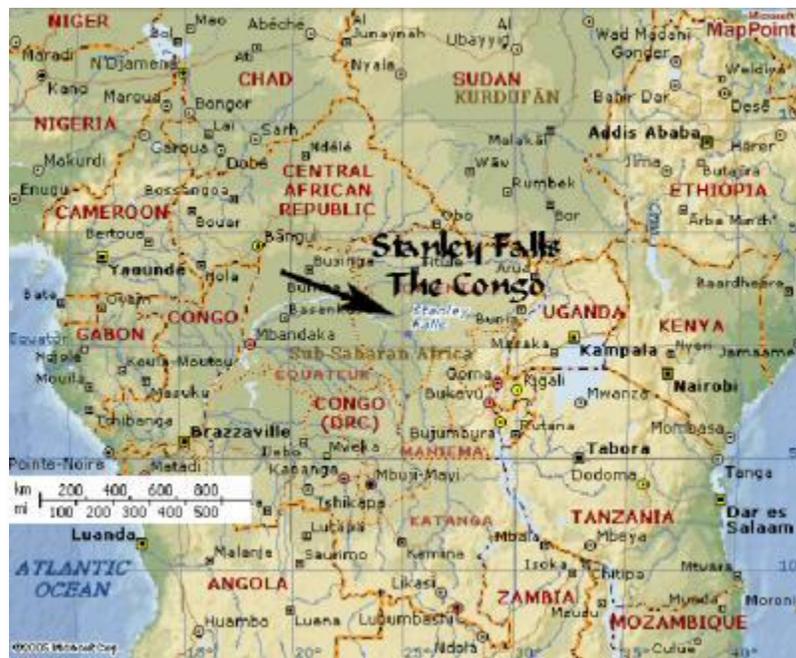
to Paris, France. Another steamship ride lands them in Colon, Panama. Then they proceed to fly over the (under construction) Panama Canal, and down the west coast of South America to Arequipa, Peru.



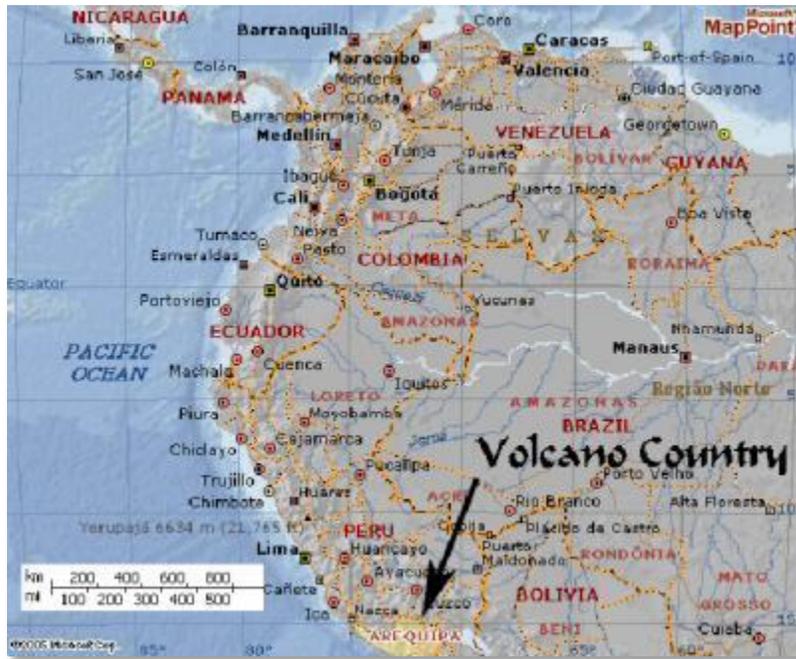
1911 Durbar with Edward V presiding.

While in India, they visit the Durbar, an ornate, pompous ceremony "held in an attempt to overawe and dazzle the local populations." These festivals were an attempt by the British to emulate their Moghul predecessors. They were held in all manner of sizes and states, but there were three particularly impressive Durbars all held in Delhi. One, held about the time of this story, was to celebrate the Coronation of George V as King of England. It's likely that this is the one Tom & Co. attended.

They hang out in Africa, again, but only run into hostile Black tribesmen as opposed to the smaller Red Pygmy ones. While there, they make new friends at the Stanly Falls Missionary Station.



Stanley Falls, Congo -- "Darkest Africa"



Arequipa Province, Peru -- Home of El Misti

Maps Courtesy of Microsoft Map Point



Volcano El Misti, Seen From Arequipa Plaza.

Eternal snow can be seen on the summit of 19,100 ft "el Misti" (The Gentleman) above. "Chachani" and the "Picchu Picchu" are two other famous local volcanoes. The Pacific coast is two hours travel to the west. All of these volcanoes are listed as extinct, and have not erupted (at least in our universe) since the mid-1600's. El Misti totally destroyed Arequipa during that last eruption. The city has also been devastated by earthquakes twice, since then. Shaken, but not stirred, as it were.

Photographing Volcanic Eruptions (and endangering your friends' lives) For Fun & Profit.

Buzzing around an erupting volcano hanging under a leaky gas bag filled with highly flammable "lifting vapor", is not a good way to "Make friends and Influence People," regardless of what kind of photos you get. Setting the aforementioned airship down on the slope of the mountain during the fireworks is beyond "plucky." It's suicidal. Here are several ways to die while getting the "snapshots of a lifetime:"

The most abundant gas typically released into the atmosphere from volcanic systems is water vapor (H_2O), followed by carbon dioxide (CO_2) and sulfur dioxide (SO_2). Volcanoes also release smaller amounts of others gases, including hydrogen sulfide (H_2S), hydrogen (H_2), carbon monoxide (CO), hydrogen chloride (HCL), hydrogen fluoride (HF), and helium (He). The volcanic gases that pose the greatest potential hazard to people, animals, agriculture, and property are sulfur dioxide, carbon dioxide, and hydrogen fluoride. None of these gases are good for you to breathe. Enough CO_2 would also stop *Flyer's* motor.



Volcano Photograph by C.G. Newhall on September 23, 1984

Pyroclastic flows descend the south-eastern flank of Mayon Volcano, Philippines. Maximum height of the eruption column was 49,000ft above sea level, and volcanic ash fell within about 31 miles toward the west.

Unlikely Tom & Co. could fly over this kind of dust cloud.



Lava Flow Photograph by J. Dvorak in 1983

One of the chief threats of lava flows to property owners (and aeronauts) is that the flows may burn buildings and homes (and aeroplanes!) even if the flow doesn't reach the structure. This house caught fire from the intense heat of an advancing lava flow (note red glow of flow left of the house).

Basalt has the highest temperature of any lava, typically between about $1170\text{-}1100\text{ }^{\circ}\text{C}$ ($\sim 2140\text{-}2000\text{ }^{\circ}\text{F}$). The other lava types (andesite, dacite, and rhyolite) form cooler flows with temperatures between about $1000\text{-}800\text{ }^{\circ}\text{C}$ ($\sim 1800\text{-}1500\text{ }^{\circ}\text{F}$); some flows can still move slowly at temperatures as low as about $600\text{ }^{\circ}\text{C}$ ($\sim 1100\text{ }^{\circ}\text{F}$).

JP Karenko 7/10/05

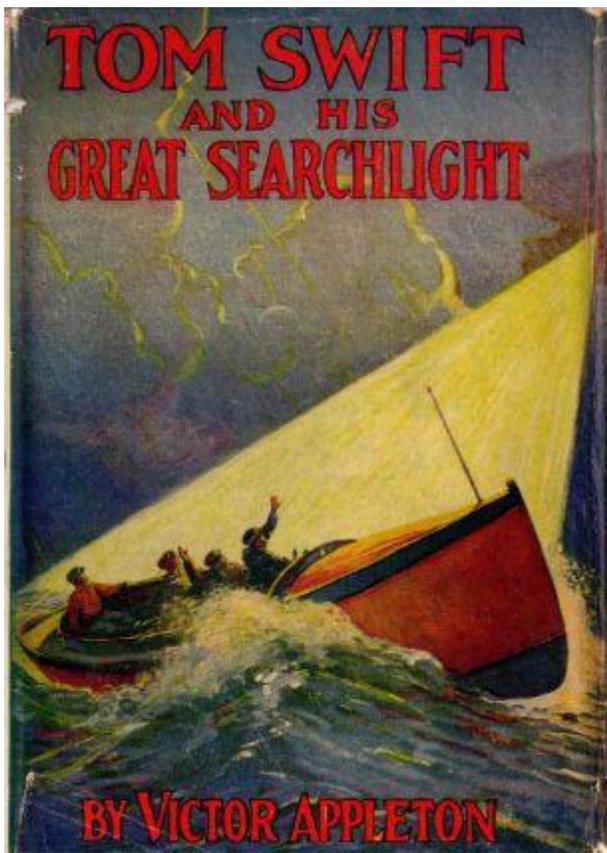
#15. Tom Swift and His Great Searchlight (1912)

or, On the Border For Uncle Sam

Review by JP Karenko, May 2005

Full-color image courtesy of Carl Swanstrom

White Quad and Duotone dustjacket from the collection of Mark Snyder

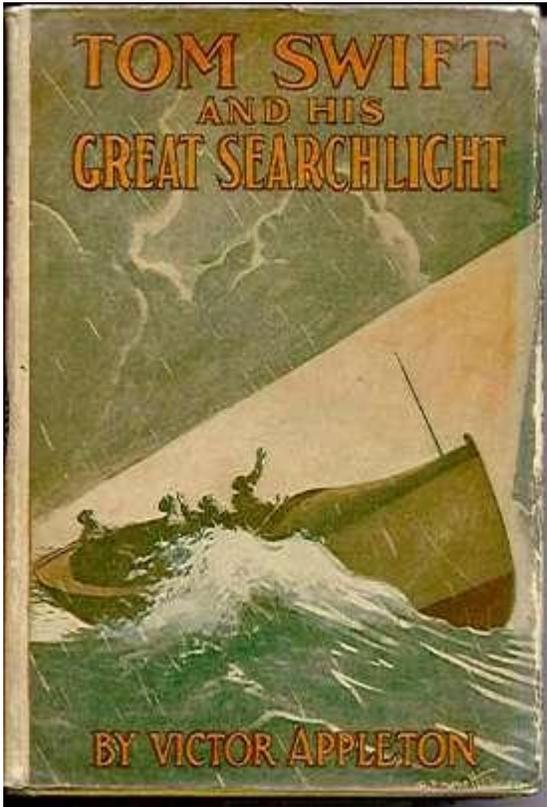


Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows: US Customs has been fruitlessly pursuing smugglers who have been bringing contraband gems, silk, lace and other valuables across the Canadian border into the US, apparently using airships. Shopton seems to be a waypoint for the repackaging and trans-shipment of these goods. When Andy Foger, Tom's old nemesis, shows up with a new airship, the plot begins to thicken. Tom has coincidentally "invented" (with the able assistance of giant manservant Koku,) a searchlight brighter than any other due to it being given an electrical current "of peculiar strength and intensity"--a current, it was described, "that would seem to be made especially for searchlights." The brilliant beam, mounted on Tom's "noiseless" airship Falcon, is used to discover and track down the smugglers.

Cast of Characters (More or less in order of appearance)

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. Is a decent cook, too.

Ned Newton--Chum & companion of Tom, once again, employed as a cashier in Shopton National Bank. (In the previous volume, it was said he no longer worked at the bank.) We find in chapter IV that he attends church regularly.



Andy Foger--Red haired, squinty-eyed bully, who makes great trouble for Tom. "Poor little rich kid," son of wealthy family, born with a chip on his shoulder. Reckless, blustery and angry. "Has money, but lately not much.-Well, he does have a new bi-plane..." This time, he is messing with the "Feds," and ultimately feels the heat.

Sam Snedecker--Cohort of Andy Foger. No current description given. We know from other tomes that he has "big ears."

Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited cognitive facilities. Described as "simple and child like," he is antagonist and rival of Eradicate, "--so strong. He doesn't realize how much muscle he has." A man, immense in size, a veritable (8-foot tall) giant, one of two whom Tom Swift had brought away from captivity with him. Koku's English is strange, for he frequently gets his words backwards. Koku also likes to talk, (as in gossip.)

Barton Swift--Widower. Wealthy and conservative. Inventor master machinist and holder of numerous patents. In this episode, he is described as "aged, nervous, distracted and sometimes oblivious to his surroundings." Mr. Swift, has failed in his health of late, and the doctor has recommended him to be out of doors as much as possible. He delights in gardening, and is now at it, all day.

Mrs. Baggert--Housekeeper. Kindly, and "loves Tom like a son." Employed by the Swift family for 10+ years at the time of this story. She is short of stature and has to stand on a soap box to kiss Tom goodbye on one of his voyages.

Mr. and Mrs. (Amos) Nestor--The parents of Mary. Passing mention.

James Dillon--A carpenter who lives down the street. Hired by Fogers.

Special Agent William Whitford--Of the United States Customs force, a big man, with a badge under his lapel.

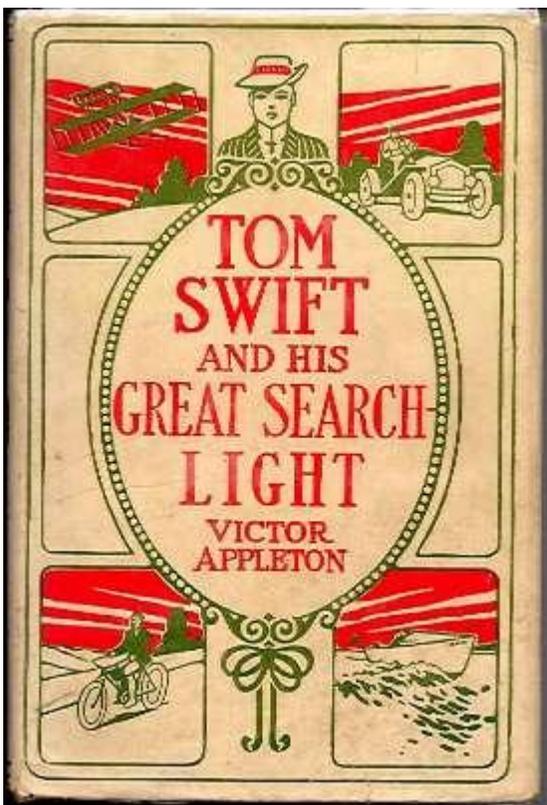
Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro journeyman jack-of-all-trades. "Eradicates dirt." In this episode, is suffering the ravages of old age, including difficulty moving and "having de misery in his back." Eradicate is "geting (sic) batty" in his old age, and I guess is now 'seeing things.' He and his mule **Boomerang** are growing old together. Eradicate has now become too old to do much.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. Apparently quite wealthy, he has graduated from cycles and automobiles, to piloting Tom's airship. In spite of having ongoing trouble controlling any conveyance he tries to command, (including airship *Red Cloud*, See Book #5) he does a creditable job of flying the *Falcon*, while in pursuit of the aerial bad-guys... In this volume, resides in the neighboring town of Waterford (See errata) Mr. Damon's house, is an estate, situated as it is in the midst of extensive grounds including the garden,"

Mrs Damon--NFN given. "She's more than ever opposed to airships," according to Mr. D. (The odd man had an idea that she was violently opposed to his trips.) She was routinely nearly always willing to let him do as he liked.

Miss Mary Nestor--Budding love interest who lives in neighboring town of Mansburg. Described as a "fair young woman with flashing brown eyes." Blushes easily, especially around Tom. Gives Tom a book of poetry, much to Ned Newton's amusement.

Mr. Foger--NFN given. Currently impoverished, and reduced to a life of crime. Still blustery and pompous, would probably make a good US Senator... Role model for nasty son, Andy. Currently resides in Logansville, not very far from the Canadian border.



Colonel Henry Denterby--A Civil War veteran, described as something of a fire-eater. "Search my house; eh? Well I guess not! A man's house is his castle, sir! That's what it is. No one shall enter mine, no matter if he is a government official, unless I give him permission, sir! And I won't do that, sir!"

Sam, the chicken thief--Most likely **Samuel Rastus Washington Jackson Johnson**. He was introduced in the previous volume, as Rad's cousin, and seems to spend a lot of time counting other folks' chickens. He is a person, who Tom describes as a 'worthless character about the town.' When caught raiding Rad's poultry, he states: "I didn't go fo' to do nuffin', Massa Tom. I were jest goin' t' look in de coop, t' count an' see how many fowls mah friend Eradicate had."

The Committee of Three--Most likely Andy and the two unnamed fellows with him in the airship.

The Nocturnal Prowler--May be Ike Shafton, below.

Castaways of the Sinking Yacht--Contains **Mr. & Mrs. Jacob Illingway**, the missionaries Tom saved from the Red Pygmies, and three other unnamed and descriptionless men.

Ike Shafton--A man who pretended to give US Agents information about smugglers that drew them off on a false scent.

Big Foot--Chief of St. Regis Mohawk tribe. Large left foot. Good natured, but a "little off" in his head."

The Canadian-Side Smugglers-- Several unnamed, rough and unpleasant men, armed with unspecified weapons.

Mr. (James) Period--Motion picture promoter and purveyor of Tom's Wizard Camera films. Wants photos of the smugglers' apprehension. His time is now more valuable than ever, now \$100 a minute, up from the dollar a minute rate when he was first introduced in the previous volume. Wears a "brilliant" red neck tie.

The Airship (US Side) Smugglers-- The Fogers, father and son, plus several unnamed and undescribed men.

Major Inventions

We start by leveraging two old inventions. "...*at last* I have perfected my noiseless airship motor! -- the secret lies in a new way of feeding gasoline into the motor, a new sparking device, and an improved muffler". It is said the aircraft cannot be heard from a distance of ten feet. These developments have taken three story volumes to perfect. (Perhaps Tom is slowing down in his old age???)

"I'll set my automatic (Wizard) camera (Book #14) to take the moving pictures of anyone who tries to get in my shop, or in the chicken coop. I'll also set the burglar alarm." (Holy surveillance camera, Batman! A burglar alarm for chickens? Whoops, wrong program.)

A searchlight Tom had fixed outside his bedroom window, never before had such a powerful beam "There must be something that I have stumbled on by accident. Say, that is a light all right! Why it goes for *miles and miles*. The alternating current from the automatic dynamo has become crossed with direct current from the big storage battery in a *funny way*. It must have been by accident, for never in the world would I think of connecting up in that fashion. I would have said it would have made a short circuit at once. Someone (Koku) meddled with the connections after I made them." **Tom's** accidental discovery ..."**my** latest invention, a great searchlight!" Tom takes credit for his servant's discovery. Sounds like an outfit I used to work for... Construction details include: A parabolic mirror, the lens, and the carbons and parts made from brass that is extra hard. They are mounted on the *Falcon*, a ship built to search for Platinum in Book # 13, *Tom Swift and His Air Glider*.

Commentary on Society, Attitudes, Environment & Errata

It's amazing how much technology and society have changed. Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted, like a handheld 2 Million candlepower battery powered spot light. Society's attitudes have changed, greatly, too. I wonder what people will be taking for granted 100 years from now, and what they will think of our "modern" society and its' mores (or lack of them...)

Attitudes and Prejudices: Language usage was interesting: "that sort of *bosh*" meant baloney, BS, etc. "put a little more wind in those tires," was to fill them with air. "Everyone to their notion, as the old lady said when she kissed the cow," was country wisdom, of some kind...

Instant Federal Officer? "You can have the honor of representing Uncle Sam. I'll make you assistant deputies for the night. You will be made a regular custom official. Here are some *extra* badges I always carry," Tom, really did not care for the commission, but Agent Whitford persisted.

Property rights in 1912 are already compromised when the Feds are in town: "I wouldn't do anything rash, if I were you," said the man (Agent Whitford) quietly. "As for this being private property, *that doesn't concern me.*" Later: "Mr. Whitford, Tom, Ned and I will go up the steps first, and knock. If they don't let us in, I'm going to smash the door." Reference was to a warrant-less search.

Later, after the bad guys are all corralled, Tom shares the considerable reward money with the agents. Nowadays, "The Department" gets to keep the seized contraband.

It also seems "guilty until proven innocent" is still the order of the day: Tom is taken into custody again, on simple hearsay. "It did not take Tom *many hours* to prove to the satisfaction of Mr. Whitford that none of our hero's airships had taken any part in cheating Uncle Sam out of custom duties. "Well, I don't know what to make of it," said the government agent, with a disappointed air, as he left the office of the Shopton chief of police, who, with others at Tom's request, had testified in his favor."

Native Americans played a part in this story, but in a way that was typically very demeaning. These "redmen" gathered around Tom's airship, made "guttural exclamations, and many grunts of surprise." They also abandoned the "their usual reserve," and "jabbered among themselves." The tribal leader, one "Bigfoot," seemed mostly interested in "baccy" (tobacco) and "firewater," (imported from Canada?) They played a small but significant part in pointing the way toward capturing the bad-guys. Dialogue was 100% Hollywood "dime-store" Indian with broken English, similar to Koku's. A reality check of Google, searching for NY State Indian Reservations, turned up this reference to the **St. Regis Mohawk Tribe**, AKA Mohawk Council of Akwesasne, of Hogansburg, NY 13655

Errata: Mr. Damon is back in *Waterford*, NY. The current score of his many moves between there and *Waterfield* stands at 9-Waterfield, 2-not recorded, and 6-Waterford, for 15 volumes, to date. The numbers don't total, because two volumes have him residing in *both* places at once

Spelling and typos noted were numerous. They include: "*Nonsense*, Tom! Eradicate is *geting* batty in, he and his chum *poured* over them, He was not a *vindicative* youth, *contrabrand* goods, a better *parabolic* mirror, *patrolling* the border, and nitro-glycerinne, later a note "didn't *came* trough the mail." There were broken *belts* when just previously *bolts* were made reference-to. We also had broken steering *geer* and Tom's hand is graspsd. The Falcon flies noiselessly and resistlessly. Some binoculars get *focussed*, too. I have not indicated page numbers, as I read a Gutenberg e-book edition, and the typos may have been introduced during transcription, Also, no page numbers were indicated in the e-text.

The Fogers apparently still own their Shopton house/mansion. Several volumes back, it was said they had to sell it in order to finance the trip to Mexico. While looking for the *City of Gold*, things did not turn out well for them.

In the book, "*Tom Swift in Captivity*," it was related how Tom brought away two immense men from giant land. They were twin brothers named Koku and Tofa. In that volume, Koku was renamed August, a fact, which the authors seemed to have forgotten. Koku is never called by his new name, and has become even

more "child like" and "simple" over the past two volumes. In the previous tome, Koku was given his very own *Electric Rifle*. Hm!

In the middle of the story, Tom & Ned "camouflage" the *Falcon* by "cutting branches and covering it." *Falcon* is huge-I once again reference the joke about hiding elephants in cherry trees and painting their toenails...

Engineering and Science, Fact vs. Fantasy: In this volume, it is apparent that no new limits of the scientific knowledge of the author(s) have been revealed. Tom's (or perhaps Koku's) new searchlight configuration was of an odd arc variety. It is entirely possible that a DC offset to an AC current might just produce a brighter beam, but I suspect it would not be the quantum increase claimed by Tom, i.e. "miles and miles." Arc lights don't have filaments that will burn out, but I imagine that the carbons would be consumed at a prodigious rate, if the beam was all that much brighter. I haven't yet figured out the significance of the "extra hard brass" used in construction.

I'd tack "relatively" to the descriptor "noiseless" when referenced to the *Falcon* and its power plant. Especially when run at high speeds, much of the noise a propeller-driven aircraft makes comes from the prop itself. The hand-built laminated props of the day were beautiful pieces of woodworkers' art, but not real efficient or quiet. *Falcon* is still subject to a plethora of mechanical breakdowns, even though it has been distilled from a long established design. In Chapter XX, we find out that the lifting gas used is still highly explosive, as they have a close shave with immolation due to a stuck pressure valve. They claim that the gas pressure reached 800psi, during the crisis. I'd like to see the gas bag that could contain such pressure.

Geography: The Swift homestead is now described as a "pleasant and large old-fashioned residence, in the *suburbs* of Shopton," which has apparently grown from a village to a town, and now, to something larger. The streets now seem to have curbs and pavement. They were dirt at the beginning of the series. The street by Tom's house is not a public one, being cut through by his father. Montford, in Canada, is almost opposite Logansville. Interior house lights were still gas, as Mr. Foger had to "turn on the gas and light it." Shopton is south of the Canadian border, and "that's only a few hundred miles," a bit longer distance than has been visualized in the past. Huntington, Canada, is "on the dividing line between the British possessions and New York State," and runs along solid ground (away from the St. Lawrence). It's a wild and desolate part of the country--still relatively true, even today.

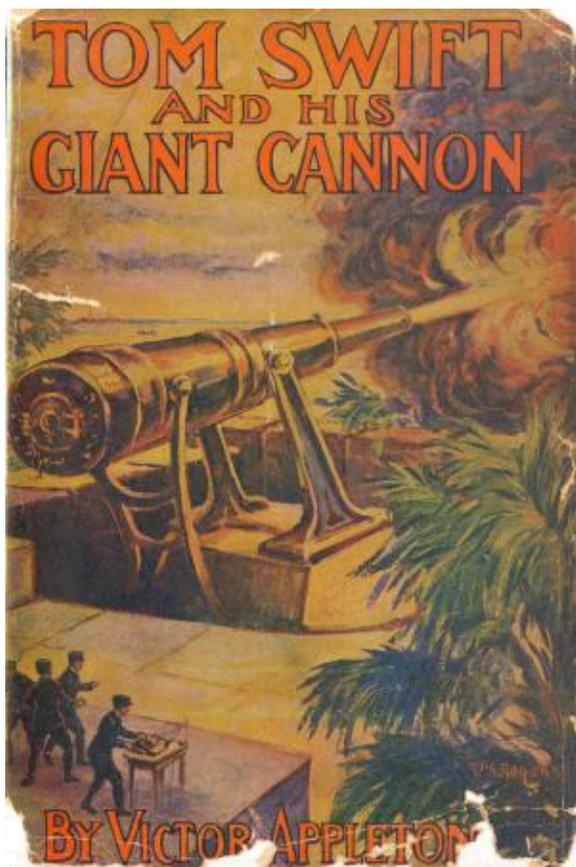
JP Karenko 7/4/05

#16. Tom Swift and His Giant Cannon (1913)

or, The Longest Shots on Record

Review by JP Karenko, July 2005

Image of a White Quad and Duotone dustjacket is from the collection of Mark Snyder



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

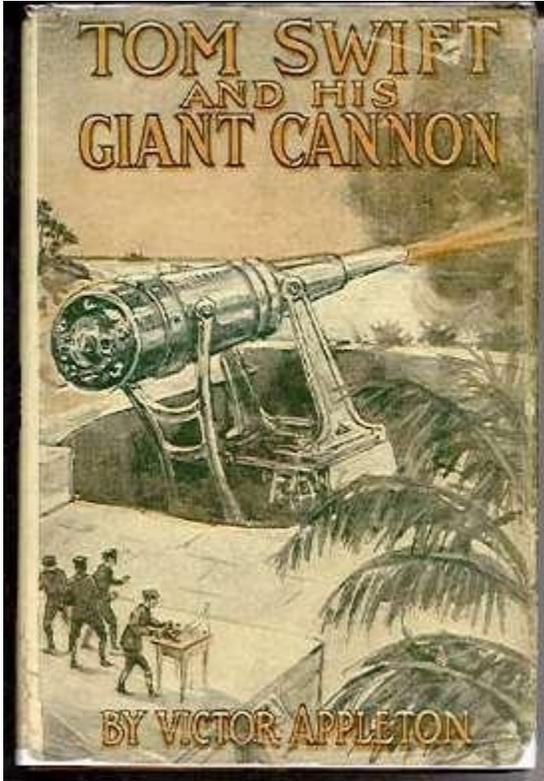
The story begins with Our Hero high and dry, hung up in the power lines that provide electricity to one of his shops. The trailing wireless antenna on the *Humming Bird* has become tangled with the charged cables and Tom is in imminent danger of once again becoming a crispy critter. Alec Peterson, a fortune hunter who is trying to get Tom's father Barton to invest in a treasure hunt, rescues Tom. The treasure Alec is searching for reposes on an island off the coast of Panama. The story then segues into the main plot, which is Tom's desire to build a giant cannon. The device is needed to protect the Panama Canal, which is approaching completion. Coincidentally, Tom has the desire to get his name in the record books for firing the longest cannon shots ever.

Tom also has to develop a new propellant to drive the two-ton 30 inch shells, a daunting and dangerous task all by itself.

This monster pop-gun is constructed in spite of the efforts of nefarious enemies and is used to save the town of Preston, NY. Just how, you will have to read the rest of the story to find out.

Cast of Characters (More or less in order of appearance)

Alec Peterson--Elderly ex-cohort of Barton Swift. Has spent his life and fortune looking for various forms of wealth, usually of a mineral nature. Looking for a backer to finance his latest expedition in search of Opal gemstones.



Barton Swift--Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. In this episode, he is described as "aged," and with "white hair." Mr. Swift, has failed in his health of late due to his "weak heart," and seems to no longer be interested in inventing or adventure.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. Quite wealthy, but only semi-retired from a life of business.

Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro journeyman jack-of-all-trades. "Eradicates dirt." Now is suffering the ravages of old age, including difficulty moving and "having de misery in his back." Eradicate has now "become too old to do much," but remains faithful to Tom and helps out where he can. Described as "tottering," he and his mule **Boomerang** are growing old together. The mule is not even mentioned in this tome.

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to

stalk game and firearms. Loves all things mechanical. Is a decent cook, too.

Mrs. Baggert--Housekeeper. Kindly, and "loves Tom like a son." Employed by the Swift family for "many" years at the time of this story. She is short of stature and has to stand on a soap box to kiss Tom goodbye on one of his voyages.

Ned Newton--Chum & companion of Tom. In this tale, no longer employed as a cashier at Shopton National Bank. Has "given up his position to become Tom's handy-lad," and has moved in at the Swift residence. He has his own "apartment," next to Tom.

Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited cognitive facilities. Described as "simple and child like," he is antagonist and rival of Eradicate. He also now resides in the Swift household, with his own apartment. Tom has taught him to pilot a small plane. (It can't be too small, as it is said that he weighs 400 lbs. and stands 9 feet tall.) More on that, later.

Miss Mary Nestor--Budding love interest. Passing mention only in this volume.

Pvt. Flynn--NFN or description, Army sentry at Sandy Hook military base. Good natured, but duty bound and obstinate.

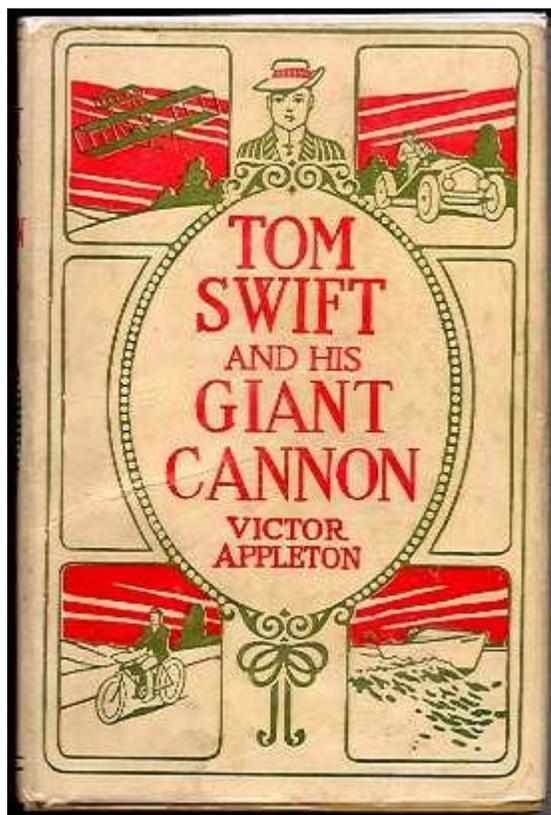
Capt. Badger--NFN or description, Sandy Hook contact, who was involved in the purchase of some of Tom's aircraft for Army testing.

Gen. Herodotus Waller--Arrogant, overconfident and blustery Army ordinance-man. Designer of a new 16-inch cannon that bursts during testing.

Col. Washburn--NFN or description, Voice of caution during cannon test. Ignored by "superiors" with disastrous results.

Adm. Woodburn--NFN or description. CNO (Chief of Naval Operations) & observer of Waller cannon test.

"Pvt. Snafu"--No actual name or description, given He gets blown up during Waller's cannon test. Seriously injured, but not fatally.



The Bearded Saboteur--Speaks with a German accent. Has tic in his eye and erect military bearing. Contaminates Tom's new gun propellant to force a failure during testing.

Sam (Johnson) the Chicken Thief--Rad's cousin, introduced in *Air Glider*. Gets a load of 12ga. rock salt from his cousin when snooping around the Swift grounds after dark.

Hans--NLN or description. German gardener at the Swift estate. Under suspicion as possible saboteur.

Plant Manager, Universal Steel Corporation (USC)--No name or description given.

Baudermann--NFN or description, except "acting crazy" and "German." USC employee who appears to be more intelligent than he lets on. Cruel, sharp and hard eyes.

Blackwell--NFN or description, except USC foreman.

Preston Dam Worker--No name or description, except as having witnessed the 1889 Johnstown Flood.

Schlicter--NFN or description. German laborer employed by USC, who ruins a batch of Tom's cannon powder. Spy/saboteur.

Capt. Waydell--NFN or description, except member of Army Ordinance Board.

Chief of Staff, US Army--No name or description. Witness to Tom's cannon test.

Gen. von Brunderger--German ex-Secret Service. Saboteur and spy trying to disrupt cannon project.

Rudolph--NLN or description, Batman/servant to Gen. von Brunderger. Accomplice in von B's plots. Is the Shopton "bearded saboteur" and the "crazy German" at USC, above.

Lt. Blake--NFN or description, except naval officer on unnamed USN warship.

Major Inventions:

Humming Bird has resurfaced, with a new style magneto. The "biggest gun ever made" is said to be 100 feet long, have a bore (caliber) of 30 inches and will throw a 4000lb shell for a distance of 30+ miles. The gun will be extra strong, combining the US technologies of both casting & layered jackets and European wire-wound manufacturing techniques.

The propellant needed to lob the SUV sized artillery shells is also new, based on guncotton and nitroglycerine.

Commentary on Society, Attitudes, Environment & Errata

It's amazing how much technology and society have changed. Reading the old Tom Swift Sr. series has really given me an appreciation of modern gadgets that most people take for granted, like modern smokeless powder and Army artillery, where bigger is no longer better-Smarter, faster and more accurate are now de rigueur.

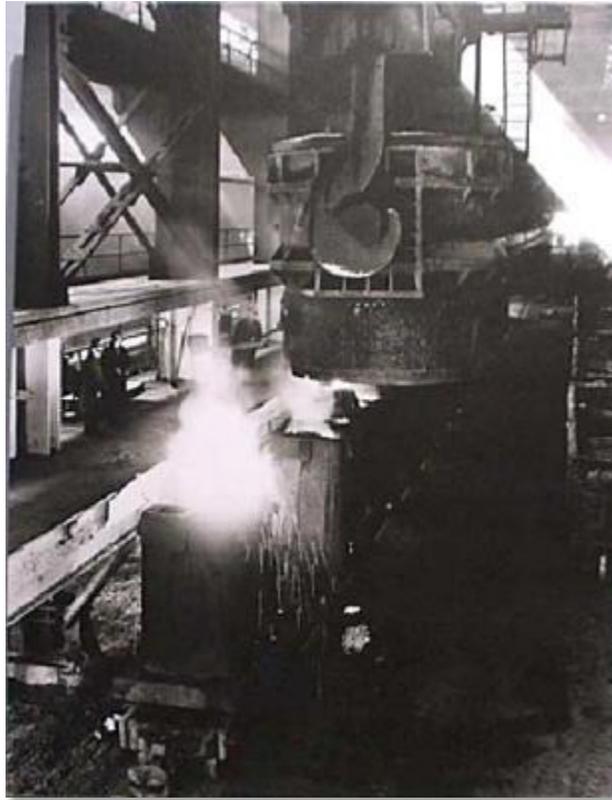
Society's attitudes have changed, greatly, too. I wonder what people will be taking for granted 100 years from now, and what they will think of our "modern" society and its' mores (or lack of them...)

Attitudes and Prejudices: Language usage was interesting: A "calamity howler" is someone who does the "Chicken Little" routine, and constantly predicts skyfall, usually loudly. Being "blown to kingdom come" was recognized, but not "back door to front door," as was said in the story. It is also said "War may never come and chances are, it never will." This was less than a year before the assassination of Archduke Ferdinand on June 28, 1914 plunged the world into armed chaos.

In spite of the relative calm of 1913 and Germany being described as "friendly to the US," German Nationals are already viewed with suspicion. They are universally being seen as spies, saboteurs and untrustworthy baddies, only smiling with their teeth, not their eyes.

Tom has to "pull wires" in order to get the Army to consider his cannon design. (Some things never seem to change...) After all, what does a home-schooled electrical engineer from an obscure burg in upstate New York know about designing big guns?

"Universal Steel Corporation" may have been Bethlehem Steel. It was one of the "big two" in 1913. It had a large foundry in Lackawanna NY near Buffalo, with the capacity to cast large cannon. Tom might have also had to go to Pittsburgh or Cleveland to get his cannon made if the Lackawanna facility were not up to the task.



Bethlehem Steel Lackawanna NY Foundry

Koku has been taught to fly a "small biplane." It can't be too small, as he stands 9 feet tall, and weighs 400lbs. Also, he repeatedly is described as "simple" and "child like." In spite of this, he gets to play with dangerous toys and has his own *Electric Rifle*. It was given to him by Tom in *Wizard Camera*.

He Swift estate now has a "power house," and the residence is electrified. Previously, lighting was gas. The house is also surrounded by shops and hangars for multiple aircraft.

Errata: Mr. Damon has been left residing in *Waterford*, NY. The current score of his many moves between there and *Waterfield* stands at 9-Waterfield, 2-not recorded, and 7-Waterford, for 16 volumes, to date. The numbers don't total, because two volumes have him residing in *both* places at the same time.

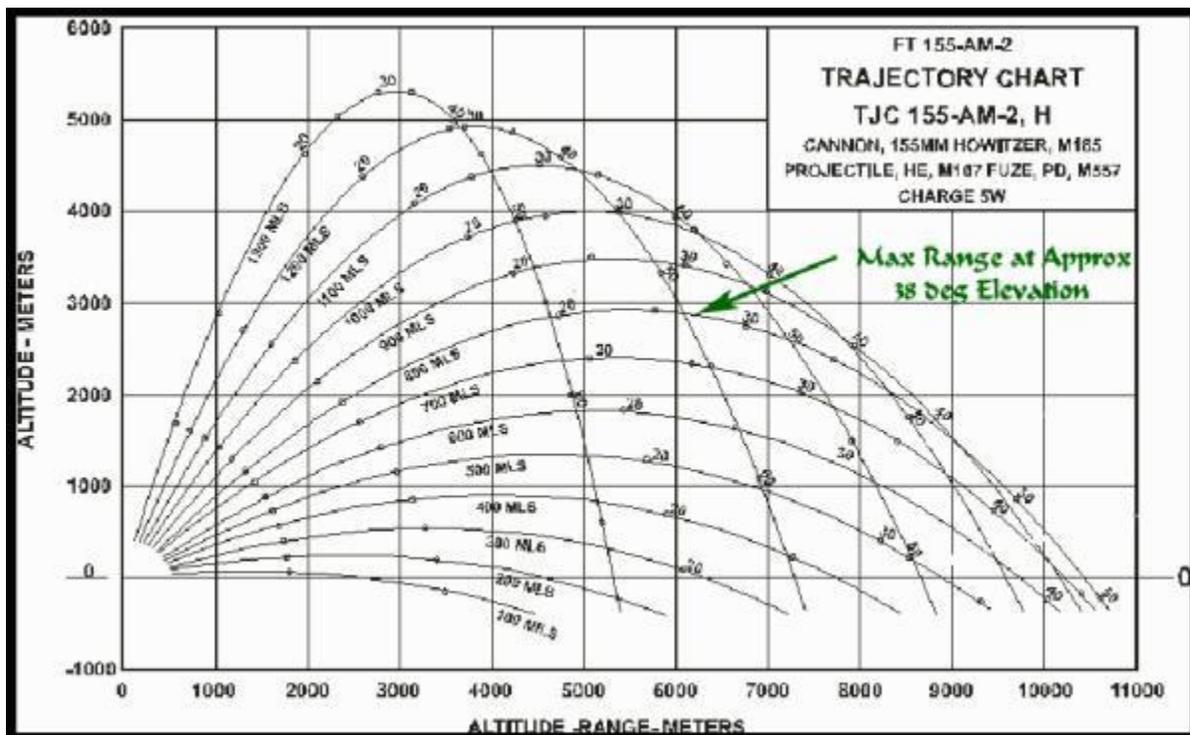
Interesting coincidences: Two names (**Preston** and Capt. **Waydell**) were reused. These names without any honorifics first appeared in *Tom Swift in Captivity*. Preston was a good-guy and Waydell was bad.

Typos were nonexistent, further reinforcing the opinion that this was a new author/editor. Three malapropisms (the kind of thing that would get past spell-checkers, had they existed in 1913) were noted. Necessaries (necessities) on p7, pardners (partners) on p197, and an imbedded (embedded) shell late in the story.

Tom has discovered the exclamation, "By Jove!" He uses it *a lot*, in this tale.

Engineering and Science, Fact vs. Fantasy: This is the most technically accurate story in the series, to date. It is apparent the author (another "new guy" from the unique "look and feel,") was either previously involved with artillery or did some darn fine research. Cannon design features such as layering, banding and wire-winding, were all state of the art for 1913. All three technologies were not typically used on the same gun, though, as it would make the product too pricey for even a military budget.

The only gun-related error noted was Tom using a flatter (lower trajectory angle) to maximize range. This US Army chart for the 155mm Howitzer would apply to Tom's gun. Maximum range is obtained at an elevation of slightly less than 40 degrees.



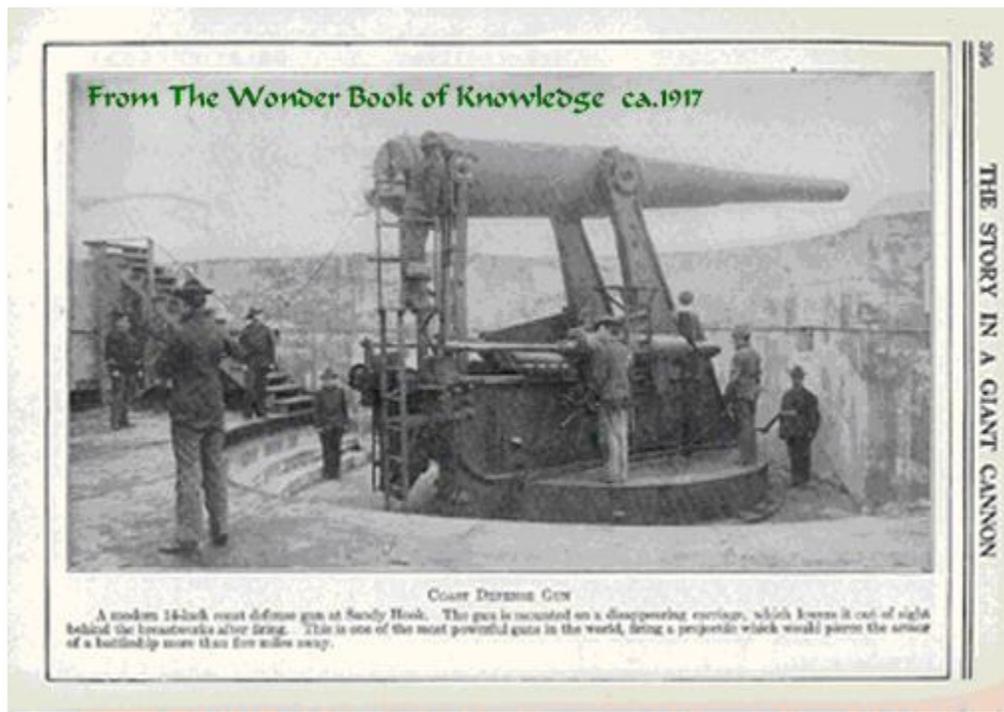
US Army Artillery Trajectory Chart

Hitting a target at a range of 30 miles within 3 feet of intended aim point in 1913 *on the first shot*, can only be considered the best of luck, or a pure pipe dream, especially when the powder charge was calculated by the SWAG method. SWAG stands for Scientific Wild-Assed Guess. (It's an engineering term.)

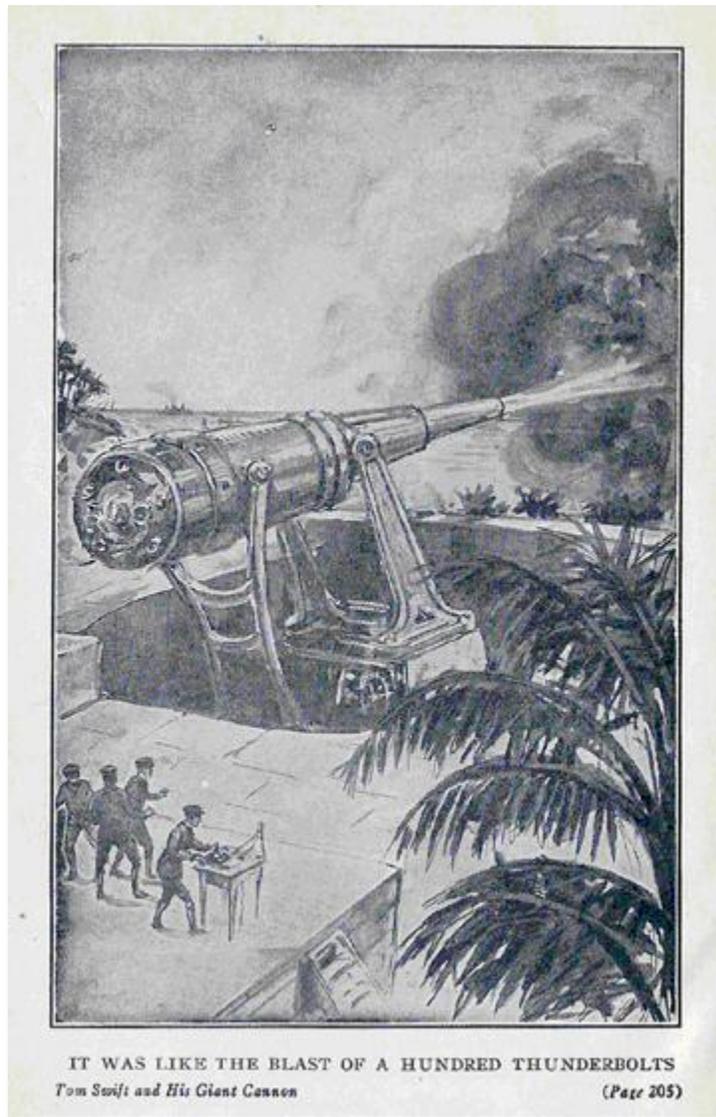
The "small speedy" *Humming Bird* is used to transport 150# Tom, 400# Koku and in excess of 500# of gunpowder to do the shot that saves Preston. But then, we already know Tom's airplanes are all miraculously efficient lifting bodies. He also lands it in the street in Preston. No overhead wires or street lamps to worry about, I guess...

Geography: There aren't too many 30-mile long valleys in New York State that have large dams at one end and convenient branching valleys that can be used to divert multi-million gallon overflows at the midpoint. The other technical issue was aiming this beast for a range of 30 miles, optically. Tom did this by line of sight with a telescopic sight. It must have been a 'dam fine one, (probably German) as the horizon is about 20 miles away on a flat section of topography, like the surface of the ocean. I suppose if the target were far enough up the side of a hill, maybe, but 30 miles is a *long* way off, and I don't want to bother with the math, right now.

Finally, note the similarity between the two following graphics. Makes you wonder if there wasn't a bit of "borrowing" of ideas going on at G&D....



Note the Page Heading. (Pvt. Snafu is the soldier on the scaffold.)



From *Giant Cannon* Frontispiece

JP Karenko 7/16/05

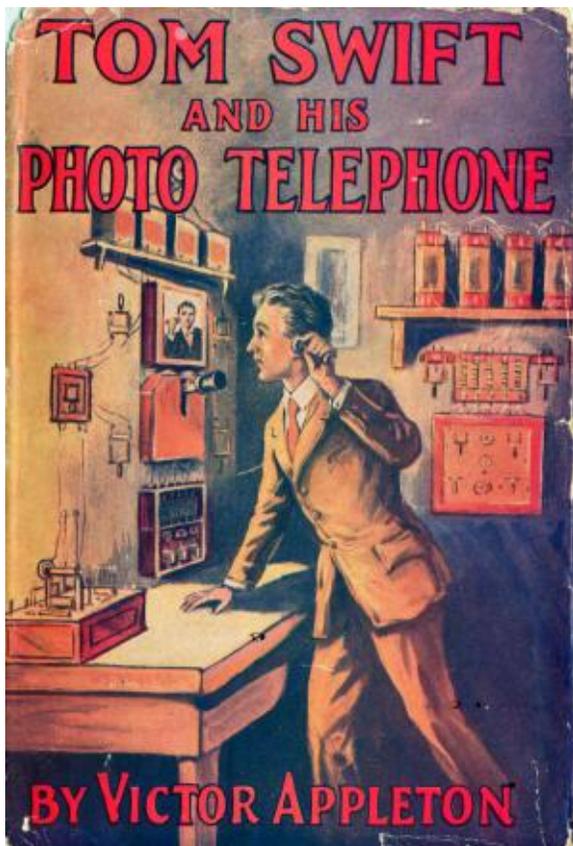
#17. Tom Swift and His Photo Telephone (1914)

or, The Picture That Saved A Fortune

Review by JP Karenko, July 2005

Full-color image from the collection of James D. Keeline

White Quad and Duotone image from the collection of Mark Snyder



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

Tom and his Dad, Barton, are talking about Tom's latest planned endeavor, a telephone that allows the image of the person speaking to be seen at either end. In the first two pages of the story, Barton tells Tom "It can't be done!" five times, with variations. Three pages later, Barton has mellowed to "Maybe you've got something there..." and by the end of the story, it's "Congratulations, my boy! I *knew* you could do it!"

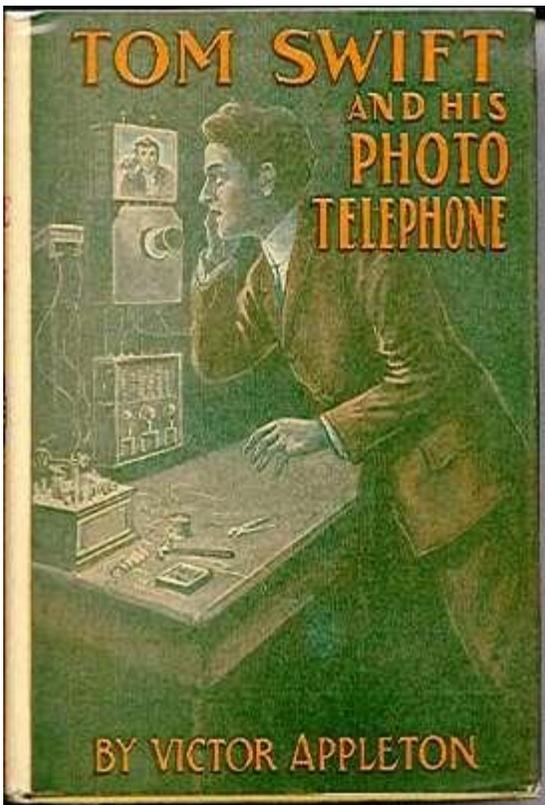
Now that I let the technical cat out of the bag regarding the success of Tom's inventive skills (you expected something less from him?) the rest of the story involves fraud, deceit and despair. Mr. Damon runs afoul of some nefarious financial manipulators and runs the risk of losing both his fortune and his life. Tom has to help locate the bad guys and bring them to justice before they "do unto" Mr. D. Figure that the PhotoPhone plays a prominent part, though, in today's world Tom would be jailed for making surveillance recordings without the knowledge of the criminals involved.

How he does all this, you will have to read the story to find out. Figure the PhotoPhone plays a prominent part, though.

Cast of Characters (More or less in order of appearance)

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. Is a decent cook, too.

Barton Swift--Widower. Wealthy and conservative. Inventor master machinist and holder of numerous patents. In this episode, he is described as "aged," Mr. Swift, has failed in his health of late, and seems to no longer be interested in inventing or adventure.



Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro journeyman jack-of-all-trades. "Eradicates dirt." Now is suffering the ravages of old age, including difficulty moving and "having de misery in his back." Described as "tottering, he and his mule **Boomerang** are growing old together. Eradicate has now "become too old to do much," but remains faithful to Tom and helps out where he can.

Grant Halling--Acquaintance of Wakefield Damon. Introduced by flying over the Swift manse and getting his plane tangled in the wireless antennas strung up there.

Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited cognitive facilities. Described as "simple and child like," he is antagonist and rival of Eradicate. Previously described as residing in the Swift Household, with his own apartment, he now occupies a "coop." Tom has taught him to pilot a small plane. (It can't be too small, as it is said that he weighs 400 lbs. and stands 9 feet tall.)

Ned Newton--Chum & companion of Tom. Is apparently back at Shopton National Bank, but is now concerned he will "lose his place" for being away so much.

Mrs. Baggert--Housekeeper. Kindly, and "loves Tom like a son." Employed by the Swift family for 10+ years at the time of this story. She is short of stature and has to stand on a soap box to kiss Tom goodbye on one of his voyages.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. Apparently quite wealthy, he has been "taken for a ride" financially, and is on the brink of ruin. He apparently is a photographer, as he has a darkroom adjoining his library.

Miss Mary Nestor--Budding love interest of Our Hero. Mere passing mention in this tale.

Shallock Peters--Scoundrel and swindler. Large stout man with florid complexion and intimidating manner. Dresses in finest clothing and is only seen in a suit with a rose boutonniere and silk top-hat. A get-rich-quick promoter.

Snuffin--NFN or description. Mechanic/driver/yes-man for Peters, above.

Mr. Huston--NFN or description. Proprietor of Ramsey's Boat Dock on Lake Carlopa

Harrison Boylan--Skinny, pale and condescending. Bag-man for Shallock Peters, above.

Minnie & Grace--NLN's or descriptions given. Young women in canoe swamped by Peters, when he goes roaring around Lake Carlopa in his powerful red motor-boat.

Mr. Ralston--NFN or description. Takes the abovementioned ladies home after their dunking.

The Happy Harry Gang--Burke, Morse, Appleson and Featherton--May be doing dirty work for Peters, as a lot of chloroform gets used. (Featherton's specialty.) Not conclusively proved, though.

After-hours Airship Absconders--Gang of 8 that filch Tom's biplane, the *Eagle*, not once, but twice.

Mrs. Damon--NFN or description given, except "motherly." This, in spite of a major role in this tale. She plays the distraught housewife when her husband is kidnapped.

Mr. Blackson--NFN or description given. Neighbor of Damon family. Passing mention.

The Mysterious Voice--Gruff & raspy voice on phone. Turns out to be Peters with a bad cold. < Harrumpf! >

Mr. Larsen--NFN or description given. Private Investigator hired by Tom.

The Helpful Telephone Manager--NFN or description given. Sets Tom up with access to equipment and facilities so the bad-guys can be tracked.

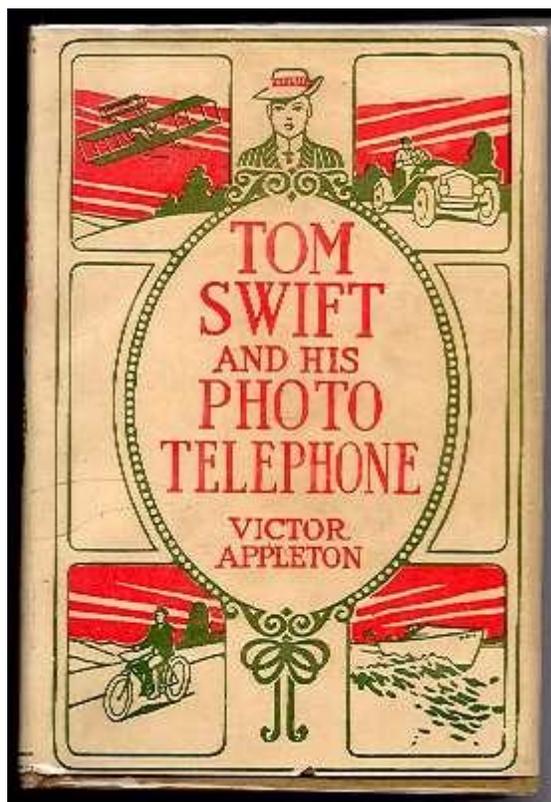
Major Inventions:

The *Kilo* is a large, luxurious motor-boat. It is not known if Tom "invented" it. The *Firefly* is yet another "speedy" two-seater aircraft. This one has one of the newfangled (presumably electric) self-starters for the motor. The *Eagle* is a 6-seat biplane, presumably of the non-dirigible variety, since a gas-bag is never mentioned and it seems to need landing and takeoff room. It needs a *Lojack*, as it gets stolen twice in the story.

Rad crosses some wires while trying to play a trick on Koku, and "invents" the *Photo Telephone*. He gets a kilovolt-level shock for his pains, a chewing out from Tom about disturbing his workbench and no credit whatsoever for making the breakthrough. Tom exclaims "MY experiment is a success!"

The Photo Telephone is based on a standard telephone but uses 3 wires, rather than the usual two, and has charged Selenium plates hooked up through an *audio* amplifier to both transmit and receive images. (See Errata.) The unit must operate under a powerful (tungsten) light to work, and a permanent recording of both picture and voice can be made at the receiving end. The picture is "fixed" via a kilovolt charge, and the plate must be developed by a wet chemical process similar to that used on photographic emulsions.

Commentary on Society, Attitudes, Environment & Errata



It's amazing how much technology and society have changed. Reading the old Tom Swift Sr. series has really given me an appreciation of the modern gadgets that I've come to take for granted. Take cell phones that record video, for example. Society's attitudes have also changed, greatly. I wonder what people will be taking for granted 100 years from now, and what they will think of our "modern" society and its' mores (or lack of them...)

Attitudes and Prejudices: Language usage was interesting: Tom's eyes "have sticks in them" when he stares at the phone screen too long. The authors discovered the semicolon key on the typewriter. It is used 5 times during dialogue in a single chapter, and then promptly forgotten, again. (Smacks to me of "management" intervention at G&D. Some editor/managers are driven to "improve" things that do not need their expert "help.") "Giving the Palm" is used to signify a reward for success in the story.

Tom is now more than willing to arrest and/or sue his nemeses in court. Previously, "thrashing" was the punishment of choice. Police have also now apparently become more effective. Conversely, many people *already* cannot afford to hire lawyers, because it is too expensive to do so.

Tom once again grabs credit for others' work. **Rad** "invents" the *Photo Telephone*, while trying to trick Koku. Previously, Koku "invented" the *Giant Searchlight*, under similar circumstances. Rad gets an electrical burn during the trick, and Tom promises medical attention, which never happens. Also, after Mr. D disappears, in spite of a stated concern for his welfare, finishing up the invention takes precedence over finding Tom's missing friend, who may be in danger. (Our All-American Hero has a few tarnished spots in his shining armor, it appears...)

Coin operated pay phones in public places are now in common use.

Tom lands his (large) airplane on a city street in Waterford. Doing so, "draws a crowd of men, women and children." (Ya think???)

Tom uses his hunting/trapping experience to logically set a trap for the bad guys-i.e. "Set your trap where you know the game will pass by, and then hide it well."

Errata: Mr. Damon has been left residing in *Waterford*, NY, for three books in a row! The current score of his many moves between there and *Waterfield* stands at 9-Waterfield, 2-not recorded, and 8-Waterford,

for 17 volumes, to date. The numbers don't total, because two volumes have him residing in *both* places at the same time. No, he does *not* maintain two domiciles...Different authors just can't coordinate their notes.

Tola, Koku's brother, is said to be in a museum, (stuffed and mounted???) rather than at the circus, where we last heard of him. Ned is working at the bank again, but fears he may "lose his place," as he spends so much time gallivanting with Tom.

Typos and malapropisms were once again very limited. On p14, Tom bets (gets) busy, earlier, a "grewsome" clue is found. Photographic plates need to "develope" with a trailing "e." Clue and gasoline are now pretty consistently the American spellings.

The drawings on both the book's paper dust jacket and the frontispiece both show Tom looking at Ned in the PhotoPhone in a big open shop. In the story, both are in closed "booth" structures under bright lights, in order to get the devices to send a good picture.

Engineering and Science, Fact vs. Fantasy

Light waves are described by the author as "a delicate form of *motion*." He is familiar with how a Selenium plate can be used as a viewing device, but is apparently unaware that one needs to pass something like x-rays *through* the plate to create the visible image. No mention of any optics was made for the phone, something that would be necessary, to at least focus an image on the plate. I'm pretty sure that this was the principle that was used in the fluoroscopes found in "better" shoe stores during the 50's. You could get an inside scoop as to what the bones in your feet looked like while you were wearing your new Buster Browns. The misty green image could be seen both by the shoe purchaser and the "trained professional" that was doing the selling.

They came oh-so-close to describing how Selenium crystals have a semi-conducting property. The transistor could have been realized 30 years sooner than it was in reality.

Speaking of *reality*...

Here's an alternate one from *2001 A Space Odyssey*, showing a "real" Photo Telephone.



Image © 1968 Turner Communications & MGM Home Entertainment Companies.

Geography: Waterford, NY, is now all grown up. It has "many shops and factories." It previously was described as a "resort town on the shore of *Lake Carlopa*."

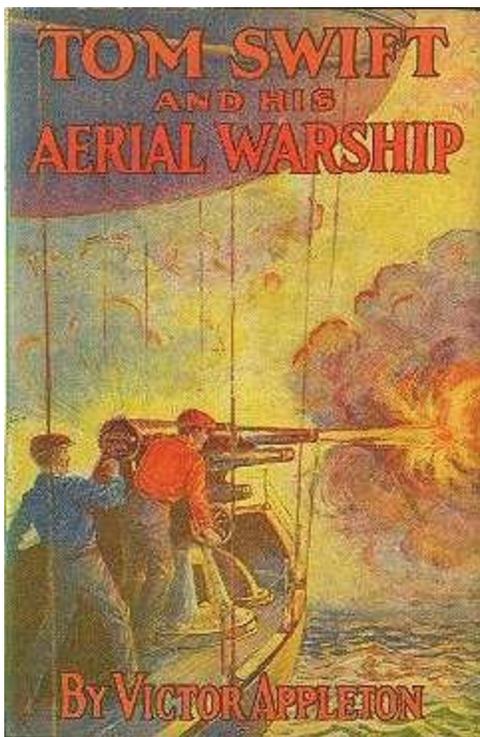
JP Karenko 7/20/05

#18. Tom Swift and His Aerial Warship (1915)

or, The Naval Terror of the Seas

Review by JP Karenko, July 2005

Image of a White Quad and Duotone dustjacket is from the collection of Mark Snyder



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

Barton Swift has lost faith in his son's abilities as an inventor. "Putting guns and bombs in an airship *just won't work*," says he. (Little does *he* know...) On the other hand, putting an incendiary device in an explosives storage shed, does. But for quick work with a ready airship, the story might have begun with a boom, rather than a mere blaze of glory. Tom's fame and success have brought him to the attention of various nefarious foreign plotters who do not want the now-famous Swift Intellect designing devices that could be used against them in the "European Conflict." The *Mars*, an armed dirigible airship is one such. But for dealing with Newton's (Sir Isaac's, not Ned's) Second Law, Uncle Sam might have a weapon that could become the *Naval Terror of the Seas*.

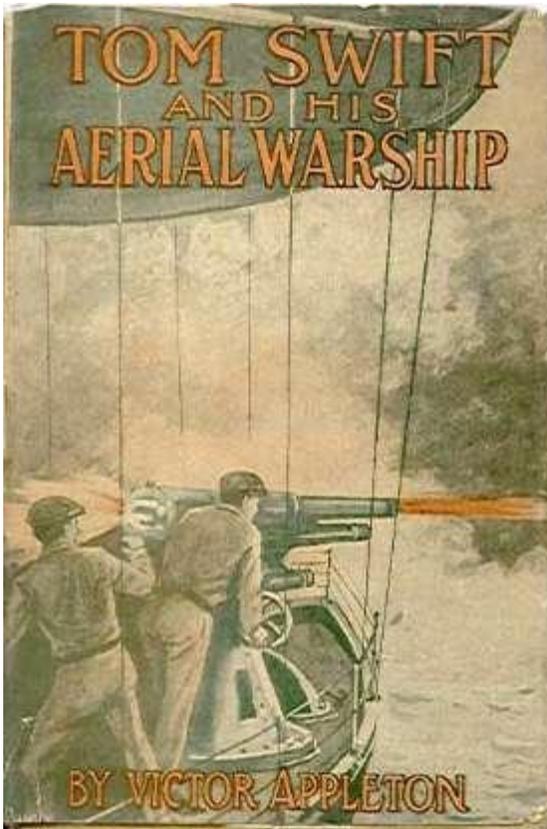
Tom has to figure out a way to fire artillery from a floating platform and convince the US Navy to purchase this poke with most of Tom's piggy-bank tied up in it.

Hazards and pitfalls are nothing new, but how they are overcome, you will have to read the story to find out.

Cast of Characters (More or less in order of appearance)

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms (even BIG ones). Loves all things mechanical. Is a decent cook, too.

Ned Newton--Chum & companion of Tom. No description has ever been given, even though he is now a primary character in these stories. Still employed as a cashier at Shopton (National) Bank.



Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited and possibly degenerating cognitive facilities. Described as "simple and child like," he is antagonist and rival of Eradicate. He also now resides in the Swift Household. His English has improved, but is still quirky.

Barton Swift--Widower. Wealthy and conservative. Inventor master machinist and holder of numerous patents. Mr. Swift, has failed in his health of late, and seems to no longer be interested in inventing or adventure. Has turned into a doomsayer, and seems to spend all his time trying to dissuade Tom from his life of inventing.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. Apparently quite wealthy, he is described as "well-dressed, short, stout and fussy." In this tale, he has become very reticent to fly with Tom in his aerial contrivances.

Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro journeyman jack-of-all-trades. "Eradicates dirt." Now suffering the ravages of old age, he now has grey hair and talks to himself. He and his mule **Boomerang** are growing old together. Eradicate has now "become too old to do much," but remains faithful to Tom and

"helps out where he can." Boomerang now has colic.

Mrs. Baggert--Housekeeper. Kindly, and "loves Tom like a son." Employed by the Swift family for 10+ years at the time of this story. She is short of stature and has to stand on a soap box to kiss Tom goodbye on one of his voyages.

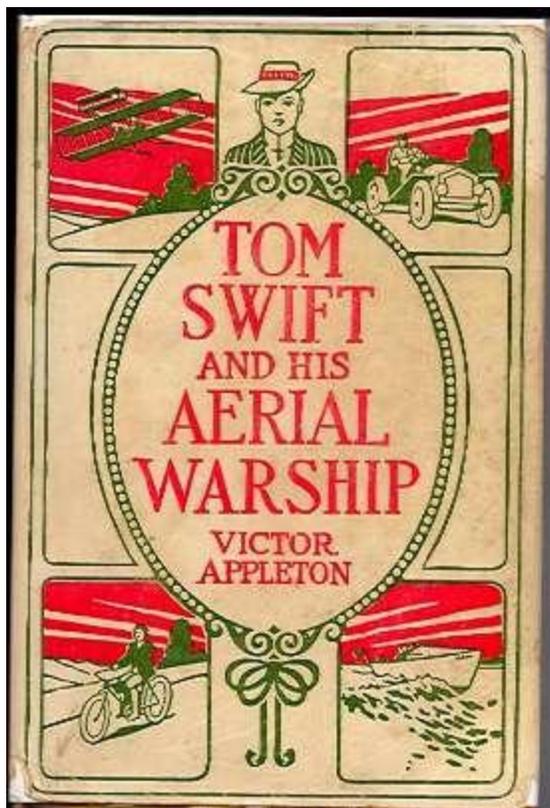
The Mysterious Foreigner--Determined to be French, a well dressed gentleman, sporting an "Imperial" moustache and beard. Pumps Rad for information about Tom's activities. Smokes "funny smelling" cigarettes.

Lt. Marbury, USN--NFN. Tall, erect American with an open honest face. Sent by Navy to oversee and evaluate Tom's new dirigible.

Rodney--NFN or description. Swift Co. messenger boy.

The Suspicious Machinist-Feldman--NFN or description. Educated and respectful, he "knows his stuff" around machinery. Spy/saboteur for unnamed foreign interests.

Miss Mary Nestor--Budding love interest. Described as a "fair young woman with flashing brown eyes." Blushes easily, especially around Tom. Has small hands, and is called "little girl" twice, by Tom.



Helen Randall--No description given. Mary Nestor's cousin from New York City. Interested in Ned Newton.

Quartet of Nocturnal No-good-niks-Feldman, Harrison, Ransom & Kurdy--No descriptions given. All recent hires at Swift plant, they are spy/saboteurs who try to steal parts of Tom's airship and destroy the rest. Feldman is hired by the **Mysterious Foreigner**, above, who it turns out is a Frenchman named **La Foy**.

George Watson--No description given. Trusted Swift engineer, who pilots *Mars* when Tom is busy.

Pierson--NFN or description given. Secret Service Agent In Charge of "the airship matter." Passing mention.

Jerry Mound--No description given. Trusted Swift employee. Chief Engineer & engine room boss on *Mars*.

George Vantor--No description given. Assistant Pilot on *Mars*. (I suspect that the author forgot he already had George Watson on board, doing that job.)

Capt. Warner, USN--NFN or description given. Lt. Marbury's commanding officer.

The Gang of Eight--Mixed bag of multinational air pirates, who hijack *Mars* and try to fly it to Europe. Led by **La Foy**, the Mysterious Foreigner, above.

Major Inventions

The *Mars* is an armed sort-of dirigible, "about the same size as a German Zeppelin." It is the "largest craft Tom Swift has ever built," measuring 600 feet in length by 60 feet in diameter. It has a top speed of 60mph sustained, with armament mounted. 75mph, without. (Typical speed in these days was 30-50mph, flat out.) It is to be used primarily as an anti-shipping weapon or against fortifications on the ground.

Power is supplied by one unspecified gasoline motor apparently driving the usual dynamo-electric motor rig through three propellers, mounted toward the rear of the envelope. Sufficient battery capacity is on board to keep operations going for 24 hours in case of main engine breakdown or battle damage. Food and

fuel are carried for two weeks cruising, and accommodations are in the typical Swift Spartan Style, with individual staterooms, a central lounge, and a separate galley. The cabin/gondola is suspended underneath the "semi-rigid gas bag." It is in three sections: 1) Pilot house/combat control center, forward. 2) Lounge/galley/living quarters, amidships and 3) Engine/mechanical/storage rooms (and presumably fuel/oil/ammo/batteries,) aft. All compartments interconnect.

Armament consists of fore & aft mounted 4-inch bore cannon. Two "quick-firers" of unspecified caliber and type are mounted on each side. Port and starboard forward and aft quarters are thus protected. A single machine gun can be deployed through an opening in the top of the gas bag to provide defensive fire against attack from above. There are also three magnetic release bomb drops that can be accessed (presumably for reloading) from the center compartment.

Lift is provided by a "non-burnable gas" of unspecified type and composition, (probably Helium) which can be made on board. (See errata.)

Commentary on Society, Attitudes, Environment & Errata

It's amazing how much technology and society have changed in the last 95 years. Reading the old Tom Swift Sr. series has really given me an appreciation of how much Society's attitudes have changed. I wonder what people will be taking for granted 100 years from now, and what they will think of our "modern" society and its' mores (or lack of them...)

Attitudes and Prejudices: Language usage was interesting, with many "quaint" words of wisdom quoted, usually by Ned Newton. Domestic attitudes were typical, with Rad and to a lesser extent Koku, being denigrated with the usual racial stereotypes and derogatory descriptions. However, there is a new xenophobia that is exhibited toward anyone who is "foreign." British, French, German, Russian, and Italian characters are all treated with equal suspicion and disdain. The "European Conflict" is made mention of twice, but not with any depth. America is riddled with spies and saboteurs representing (mostly) the countries above, and *all* are hostile toward the US. What is interesting is that even the countries warring with each other in Europe are all united in plotting against America, which has not yet entered the conflict and at the time was isolationist/neutral, and determined to remain so.

Ned Newton comes up with an idea for an artillery recoil reducer (See Errata) and Tom, uncharacteristically, gives him credit for it. Enthusiastically! Several times!! Our hero has in the past, unabashedly grabbed credit for other peoples' ideas and claimed them for his own--after "improvement," of course.... (Koku actually found the secret of the *Great Searchlight*, and Rad discovered the secret to making the *Photo Telephone* work, in previous volumes.)

Errata: Mr. Damon has been left residing in *Waterford*, NY. This is now four books in a row, and the score is tied! The current tally of his many moves between *Waterford* and *Waterfield* stands at 9-Waterfield,

2-not recorded, and 9-Waterford, for 18 volumes, to date. The numbers don't total, because two volumes have him residing in *both* places at the same time, and two do not specify his hometown. No, he does *not* maintain two domiciles...Different authors just can't seem to coordinate their notes.

Speaking of new authors: Once again, we have a new "look and feel" in Tom's Universe. There was not a single typo or malapropism noted in the entire text. The level of grammar and usage was also improved. On the other hand, this story is the first of many, (unfortunately) where the use of "padding" was *very obvious* to stretch the bulk of a 75 page story text to fit a 225 page format. Endless repetition made reading tedious with as many as six or more steps being used to stretch a given story line incident. 1) I have a feeling that x could *possibly* happen. 2) Do you *really* think x could really happen? 3) Maybe we had better plan (or have an invention in place) *just in case* x happens. 4) No, x *couldn't possibly* happen, 5) By Jove, x *did* happen! 6) I wonder *why* x happened? 7) It's a *terrible thing* that x happened. 8) Good thing Tom invented y to take care of x happening. 'Scuze me while I go barf...too much of a good thing.

Along the lines of the "new guy" doing the writing, characters do not behave as expected. Normally nearly fearless Mr. Damon, turns into a "nervous Nellie" and does not want to fly in Tom's latest creation. Ned has mood swings that would befit a manic-depressive, and Koku's English undergoes another transformation toward "normal" but now, he "knows nothing of mechanical things" and "can't be trusted to tighten up a simple nut." This is the same fellow who saved Tom's bee-hind by holding together a broken motor mount while standing watch (alone) in the engine room of an earlier airship.

There is also some pretty inane behavior, too. After *Mars* gets hijacked by armed and desperate foreign spies (a veritable United Nations' worth) Mr. Damon suggests that: they "get out of their prison, (an empty store room) call a policeman and have them (the spies) prosecuted." Mr. D. even volunteers the services of his lawyer "to exact the full punishment proscribed by statute." It also appears that confronting armed pirates over open ocean with "indignant" attitudes and claims of "rights" are also considered viable plans. Reality check: did I just hear gunshots and splashing noises, or just a long fading yell and a splash???

The author has apparently never seen how big the muzzle of even a "little" pistol looks when it's pointed at you in anger. It's an experience I can't recommend.

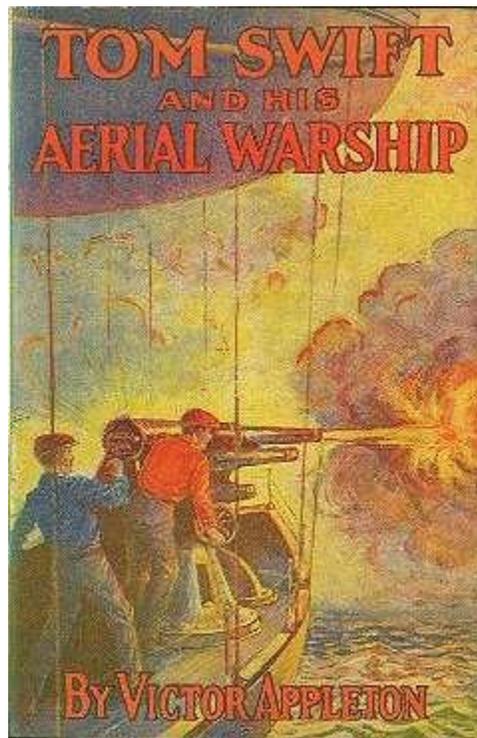
One of the biggest innovations in light gunnery was the French 75mm (3 inch) gun. It had an efficient hydro-pneumatic recoil absorption mechanism. Beginning with the Model 1897 French 75-mm rapid-fire field piece, the famous French '75, made it possible to combine great accuracy with high rates of fire. Most of the light guns of the time were howitzers, used for high-angle firing. Guns like the French 75 could also be used in a direct-fire role. Ned's idea was in use for almost 20 years. He merely "reinvented the wheel."

Engineering and Science, Fact vs. Fantasy

Helium is a colorless, odorless, tasteless chemical element, one of the "noble" gases. While it is the second most abundant element in the universe, significant amounts are found on Earth only mixed in with natural gas. Rather than Tom's highly explosive magic lifting gas used in previous airships, this must be the vapor of choice for *Mars*, as a war machine would have to be able to withstand both offensive and defensive gunfire without burning. The downside of this conclusion, is that Helium only occurs in nature and cannot be manufactured at need, as was stated in the story.

The **ballast** Tom drops to put out the Red Shed Fire at the beginning of the story was indeed most likely sand, since most smaller balloon-type airships used it. Whether there was enough to smother a sizeable fire is problematic. Watching the yo-yo effect when Tom dumps most or all of his ballast load on the fire must have been comical. The gas would have had to be rapidly vented to prevent Tom from landing in Oz or some other faraway place, but not too rapidly, causing a smash. Water is the traditional ballast in rigid airships, since it is cheap and plentiful. Ballast must be expendable, being anything with weight that can be jettisoned from the vehicle. Ballast is dropped by an airship to compensate for lost lifting gas or to ascend more quickly.

Armament: Mars is described as a "sort-of" Zeppelin. The frontispiece illustration and dust jacket, show Tone-Deaf Tom and Nearly Headless Ned touching off a 4-inch cannon in a canoe-shaped gondola *suspended by cables*. Aside from the lack of hearing protection, anyone near this sort-of recoilless setup would get blown or tossed overboard.



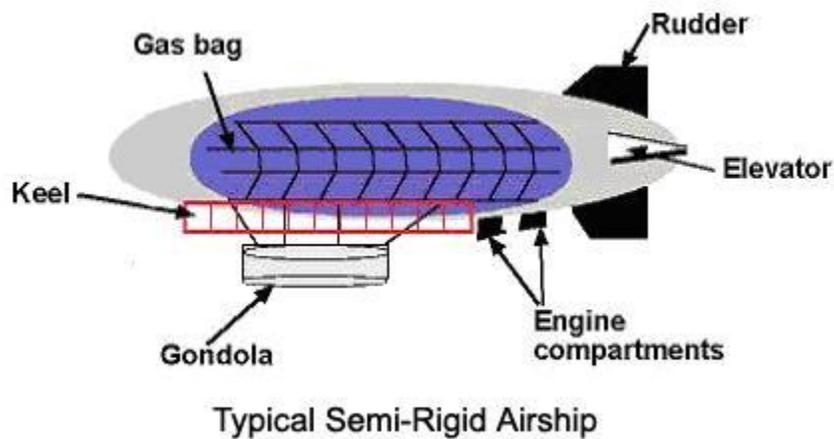
In order for the "sort-of" recoilless cannon idea to work, one would need a clear field of fire both in front-of *and behind* the cannon/quick-firer in question. This would give extremely limited field of fire to prevent back-blast from destroying the gas bag, gondola or gunnery officers. I also suspect the heavy cannon and other armament would have to be kept close to the airship centerline to prevent severe weight and balance issues as ammunition was expended. Also, no-one ever explained how a blimp can sink a battleship with a pair of mere 4-inch guns. Bombs, yes, as the folks on *Tirpitz* found out, some 30 years later. (Those were a bit bigger than the ones carried on *Mars*.)

Bombs were indeed quite practical, and Germany had great plans to use airships as bombers, until the Brits perfected a practical incendiary round for anti-aircraft machine guns and cannons. Hydrogen balloons burn beautifully, with little provocation.

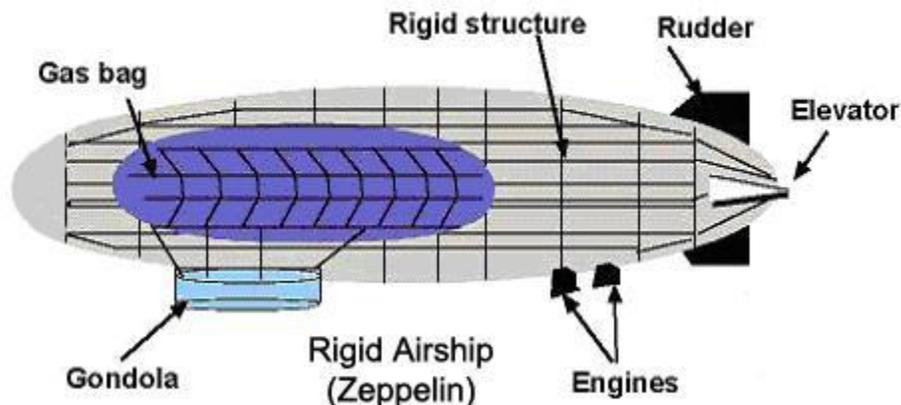
Size Matters: No one has considered how big this beast really has to be to lift all that heavy ordinance and fuel/supplies. Tom's *Mars* had an envelope length of 600ft. (about 200m) Zeppelin No. 3 at 160m length had only 13000 cubic meters gas capacity and a 5500lb net lift with Helium gas. This means *Mars* could do a bigger all-up gross lift, but even at double the gas volume, we are talking a major load to carry. Keep in mind this beast carried a monster load of batteries as backup for the main power plant.

Costs: According to numbers found during a Google search, a 1915 era Zeppelin cost about \$100,000 to build. Filling the gas bag with 26,000 cubic meters of Hydrogen (That's about one *million* cubic feet) would cost \$10,000. Helium is half again as expensive which means a fill-up would be \$15,000, plus leakage, plus venting etc. We're talking big bucks in 1915 dollars, even for Swift Construction Co.

Construction: The *Mars* was described as a "sort-of" Zeppelin. It had to be either a "semi-rigid" or "rigid" design, in order to have a structure strong enough to support heavy ordinance and all that luxury.



It is likely the author was somewhat familiar with this subject and chose to make *Mars* a hybrid, just so it could be "original."

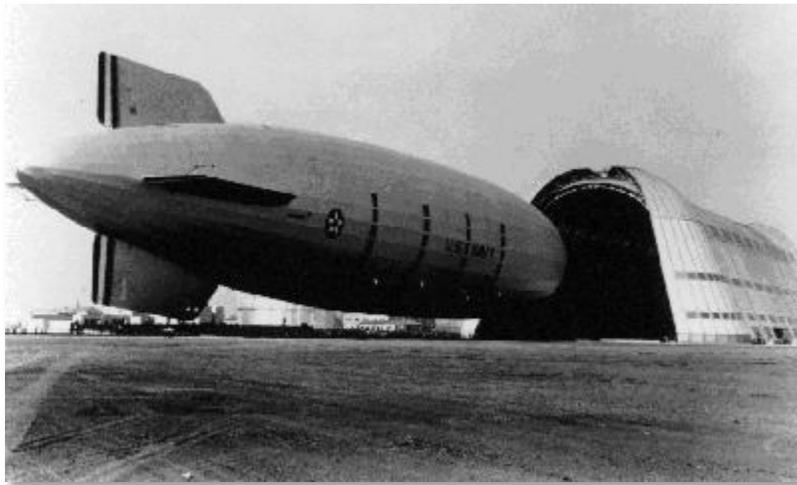


It was never explained how the gun platforms were tied into the structure, either, but most of these mundane details were left up to the imagination of the reader.

Motive power: The smaller Zeppelin was powered with three 550hp motors. Tom's beast has one motor of unspecified power that apparently drives a dynamo-electric motor rigged to three propellers. These would have to be driven with exposed (shudder!) belts or chains. A saboteur shorts the *electric motor* with a copper bar, causing it to burn-out. I believe the author meant to say the *dynamo* was damaged, as they kept on under battery power. A burnt-out motor would not work with or without batteries.

Geography: *Swift Construction Company* has sprung from the loins of the author, full grown. In the short period of time since the conclusion of *Photo Telephone*, a factory complex has risen with many "trusted" employees, including pilots and multiple engineers, (whatever happened to Garret Jackson?) an on-site fire brigade, and the usual shops and labs. There's still enough open room to test-fire artillery, though. I wonder what the neighbors think of all this urban blight-this was a residential area, a few volumes back...

The typical WW2-era dirigible hangar shown below is a bit bigger than Tom's "shed" used to house the *Mars*. *Mars* was described as 600ft long by 60ft in diameter. From comments in the text, the gondola with all the mechanicals and living areas was "suspended" below the gas bag. An airship hangar is basically a barn with big doors at both ends. A structural roof (which opens completely like a giant clam, in Tom's Universe, allowing vertical take-off) is needed to give rigidity to the walls and bear the weight of snow and wind loads. (This *is* upstate New York we are talking about, here.) The massive wooden structure shown below is 1,040 feet long, 150 feet high and 296 feet wide. The airship is the ill-fated *Macon* at 840 ft length. People (under fin) barely show.



JP Karenko 7/25/05

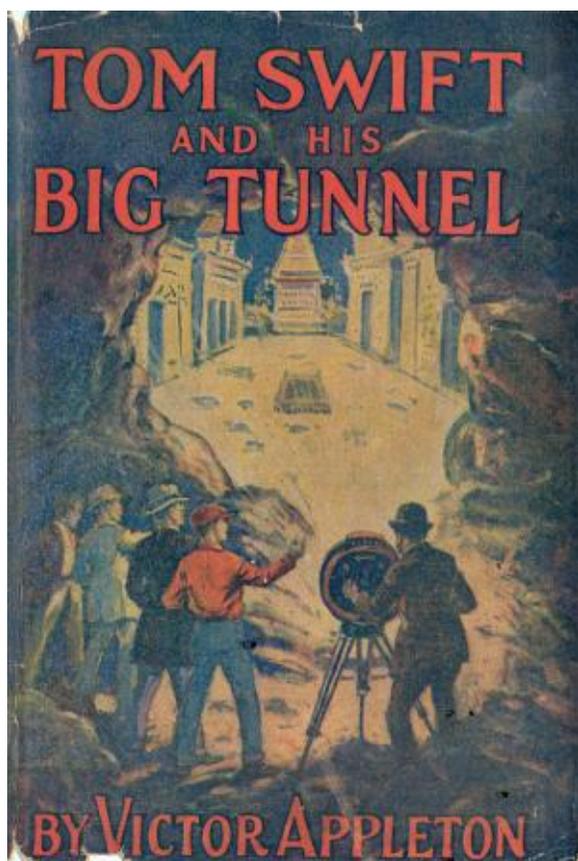
#19. Tom Swift and his Big Tunnel (1916)

Or, The Hidden City of the Andes

Review by JP Karenko, March 2005

Full-color image from the collection of James D. Keeline

White Quad and Duotone images from the collection of Mark Snyder



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

The book opens with Tom working on "solving a puzzling question that had arisen in one of his inventions." His giant manservant Koku, announces a visitor--one Mr. Job Titus of *Titus Brothers Construction Company*, who is here to purchase some of Tom's *Giant Cannon* powder to use in a tunnel construction project in Peru.

Titus Bros. has contracted to drive a railroad tunnel through an Andes mountain peak, and has hit a deposit of "hard, dense rock, like Obsidian." If the tunnel cannot be completed on time *Blakeson & Grinder*, a rival company, will get the contract and reap the reward, while the Titus Brothers will be ruined.

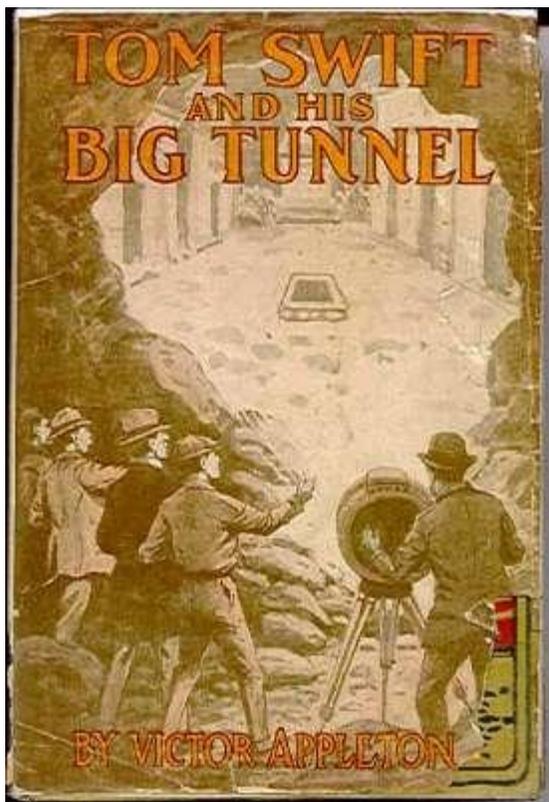
Tom develops a blasting powder, based on his *Giant Cannon* propellant, and in the company of Titus and Mr. Damon (who, coincidentally has a business interest in the same area of Peru) depart for South America, via rail and steamship.

Along the way, Tom & Ned are accosted by bearded (--they are *always* bearded...) spies, assaulted with a bomb, suffer hardships, solve mysteries, save a baby's life and help break a native labor strike that threatens the project's completion. A subterranean lost city is found. It becomes a stop on the rail line and ultimately, a tourist attraction.

Cast of Characters (More or less in order of appearance)

Tom Swift--Intrepid Inventor, Hero, and now, betrothed love interest of Miss Mary Nestor.

Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited mental facilities. Antagonist and rival of Eradicate.



Eradicate Sampson, A.K.A. Rad--Aged stereotypical Negro manservant given over to the ravages of advanced age (Rheumatism and failing eyesight.) Constant antagonist of Koku. In this episode it is confirmed that he is an ex-Civil War Era slave. His faithful mule **Boomerang** is not mentioned in this episode.

Ned Newton--Chum & constant companion of Tom, currently employed at a Shopton bank. Lately has a 'better position' at the bank and has less time to go adventuring with Tom. Passing mention in this tale. (Considering how much work he misses, I wonder why he keeps getting promoted?)

Mr. Job Titus--Principal Contact of *Titus Brothers Construction Company*.

Mr. Wakefield Damon--Elderly & eccentric adventurer and traveling companion of Tom & Ned, whose main purpose in life seems to be blessing everybody and everything near his person. In this tome, he "resides in a nearby (unnamed) town," and is introduced by falling off a runaway horse, on his way to visit Tom.

Isaac Waddington, A.K.A. Senor Pinto--Evil agent of *Blakeson & Grinder (B&G)*, a rival tunnel construction firm, dedicated to bringing the Titus Brothers and their project to ruin. Late in the story, he contracts a fever that ultimately will kill him. He repents of his crimes and is forgiven by Tom & Mr. Titus, while on his deathbed.

Miss Mary Nestor--Love interest of Tom. Plucky, courageous, intelligent and apparently engaged to Our Hero, although no direct mention is made except a reference to "son-in-law," in a scathing letter from her father, mid-story.

Barton Swift--Widower. Wealthy and conservative. Inventor master machinist and holder of numerous patents. Mr. Swift, has failed in his health of late, and seems to no longer be interested in inventing or adventure. Has turned into a doomsayer, and seems to spend all his time trying to dissuade Tom from his life of inventing. Walk-on part in this tale.

Mr. & Mrs. Amos Nestor--Mary's parents. No descriptions given. Mrs. Nestor is said to be a fine cook. Her first name and description are never mentioned. Amos is apparently excitable and jumps to conclusions about Tom, in spite of having been saved by him in both the *Wireless Message* and *Wizard Camera* adventures.

Mrs. Baggert--Housekeeper. Kindly, and "loves Tom like a son." Employed by the Swift family for 15+ years at the time of this story. She is short of stature and has to stand on a soap box to kiss Tom goodbye on one of his voyages.

Professor Swyington Bumper--Semi-bumbling Archeologist/Explorer on a life-long quest to find the lost city of Pelone, hidden in the Peruvian Andes. Saves Tom and Mr. Titus by disarming a bomb meant to injure them on the steamship *Bellaconda*. Quintessential mad-scientist type: bald, skinny, short and nose-in-book. Very scatterbrained and easily distracted.

Bellaconda Steward--No name or description. Cares for ill Sr. Pinto.

Walter Titus--No description. Remaining Principal of *Titus Bros., Construction Co.*

Serato--No last name or description except "tall." Peruvian Indian straw boss. Nominally in charge of labor gangs, secretly working for *B&G* as saboteur and agent provocateur.

Tim Sullivan--No description given. Irish construction foreman at the tunnel site, possessed of a nearly unintelligible brogue.

Company Doctors--Employed by Titus Brothers. No descriptions or names given.

Peruvian Village Chieftan--No name or description. Walk-on part.

Indian Child--No name or description. Saved from mad dog by Tom using *Electric Rifle*.

Jack--NLN or description. Englishman, runs dynamo providing electricity for camp.

Senor Belasdo--Peruvian bureaucrat. May be in cahoots with *B&G*. Withholds government payments to *Titus Bros.* on a whim. Probably looking for a bribe....

Lamos--NLN. Peruvian Indian giant. Not as tall as Koku, but wider in the shoulders. Rival and antagonist of Koku, in the employ of Serato and *B&G* as agent provocateur and saboteur.

Indian family--Father's name not given--Father is a laborer, mother (Masni) provides important aid, late in story. Baby (Vashni) is saved from a Condor attack by Tom, using his *Electric Rifle*.

Indian laborers--Generally treated with disdain & contempt. Described as lazy, beggars, easily frightened and as "black imps."

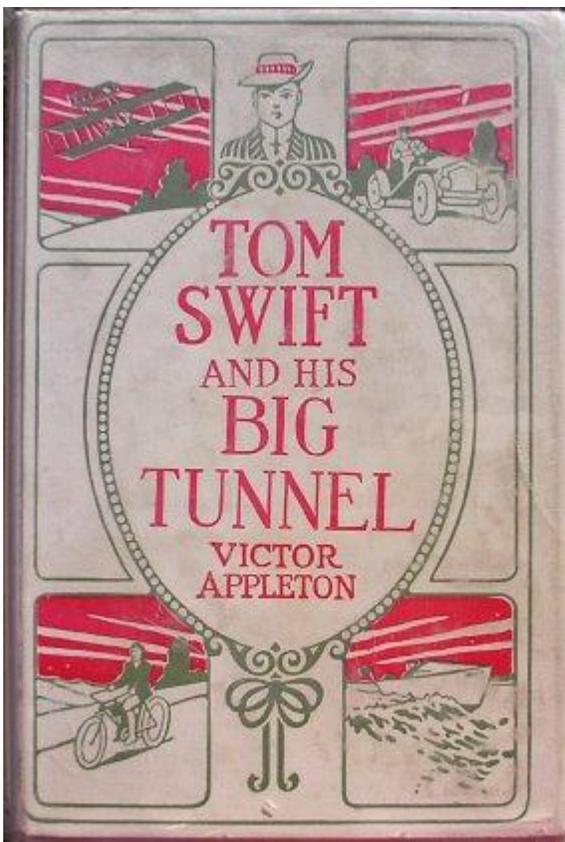
Major Inventions:

Tom Swift didn't really invent anything new in this book. He did leverage one of the things he invented in the past (*Giant Cannon* propellant), as a starting point for developing two blasting powder variations, one "slow" and one "fast," to be used in tunneling. The intriguing scientific concept here, is that when

breaking up hard, dense rock like Flint or Obsidian, a "slow explosion is needed to shatter the material ." See Errata.

Commentary on Society, Attitudes, Environment & Errata

Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted. It also has given me a grasp of just how technologically and culturally unsophisticated the average reader was in the early 1900's.



Attitudes and Prejudices: Language usage has become more modern, without the many "quaint" words of wisdom as was wont in the past. The authors did discover the word "piazza," however, and used it 5 times in 2 pages to describe the front porch on the Swift homestead. Domestic attitudes are typical, with Rad and Koku, being denigrated with the usual racial stereotypes and derogatory descriptions. Rad is now referred to as a "dear old chump" and Koku is described as "good-natured, but somewhat stupid." On the other hand, the xenophobia that was exhibited in the previous volume toward anyone who was "foreign," as well as any mention of "the European Conflict "(WW1) have vanished. The local Peruvian Indian natives are back at the bottom of the food chain, being called lazy, black imps, worthless and prone to disappearing after payday. Pay was \$0.50USD a week for hard labor, hauling rock out of the tunnel.

Errata: Mr. Damon has been relegated to residing "in a nearby town." After four books in a row in Waterford, NY, the author has apparently forgotten where he lives! The current tally of his many moves between *Waterford*

and *Waterfield* stands at 9-Waterfield, 3-not recorded, and 9-Waterford, for 19 volumes, to date. The numbers don't total, because two volumes have him residing in *both* places at the same time, and three (including this one) do not specify a town name.

Koku has shrunk from his previous height of "over 9 feet" to "almost 8 feet" tall, and his English is deteriorating. He now sounds like a Hollywood dime-store Indian, making such comments as "Master make heap good shot" when commenting on Tom's marksmanship.

Late in the story, Tim Sullivan, an Irish labor foreman with a near unintelligible brogue, seems to have no trouble communicating with the native help, previously requiring an interpreter. (Frankly, he could use one for his English...)

Typos were limited and mostly the wrong word (correctly spelled) getting past the typesetter. On p131 Tom rigs fires (wires). On p152 the woman Masni threw himself (herself) at Tom's feet. On p159 Koku sprank (sprang) up and p215 says Tom haved (saved) a baby. Two different editions (2nd ed. G&D Quad and orange cover G&D) have the same errors.

Engineering and Science, Fact vs. Fantasy

Tom & Mr. D. get a stereotypical "bomb" thrown at them early in the story. The black powder fuse is extinguished by Professor Bumper by stepping on it. Personal experience with such things, (from a misspent youth) tells me that confining a black powder fuse makes it burn faster-MUCH faster. Cutting, dousing with water or pulling it out of the iron sphere would be the way to make the "infernal device" safe. (Aside: can you imagine trying to get an iron ball filled with explosives onboard a ship, nowadays?)

It's amazing how much technology has changed. Tunneling (for a railroad, no less!) was small-scale, without use of heavy machinery and dependent primarily on manual labor. Steam-shovels were mentioned in passing, but never seen to be used.

Something that bothers me about the South America setting is that Tom & Co., had to pack to the tunnel head on mule back. It would be logical to run the rail line up to the tunnel to send in supplies, equipment and labor. After all, the line was going to be necessary, anyway, once the tunnel was completed. (Of course, that would have shortened the book by several chapters... There is an incredible amount of filler and repetition in these stories.)

Explosive charges were sized by SWAG and set off without regard for any but rudimentary safety precautions. Koku almost gets sent into orbit, when he wanders into the middle of a test shot of Tom's new explosive and parks his posterior on the rock with the test charge under it.

I'm having a teeny problem with Tom's "slow" vs. "fast" blasting powders. While I am not a mining engineer, I do know that a certain minimum propagation speed is needed to fracture even very hard rock. Modern mining engineers use a constellation of relatively small *timed* charges to create first, a void into which the blast can propagate, and then another series of delayed charges to break up the rock in a controlled manner. For those interested in details, this is discussed at length in the following document:

http://www.roscience.com/hoek/pdf/Chapter_16_of_Rock_Engineering.pdf

The techniques discussed are dependent on carefully sequenced detonations, using electrically fired, computer controlled initiators. Tom could only begin to approach this ability by using a separate charges of his "fast" and "slow" powders, not by simply adjusting the burn rate. The "big blast" in this tale would most likely simply have dropped the mountain on Pelone, making it "loster."

Speaking of, the lost city is uncovered after a massive detonation to break through some super-hard rock. It is speculated that the city was buried by earthquake, landslide or volcanic eruption. Typically those kind

of events break, crush, carry away, bury or burn up the locale in question. Pelone was found with streets clean & clear and most buildings intact. The air was clean and buildings contained artifacts. If the city had been constructed by tunneling, as the original description implied, the scenario might have been more believable. As it was? Balderdash...

Geography: Pelone is said to be located between Rimac and Ancon about 250 miles east of Lima, Peru. Ancon is actually a coastal town about 15 miles north of the port of Callao (Lima's gateway to the Pacific). Rimac is indeed in the location specified, (almost to Bolivia) but well out of the mountains. The author's research may have been spotty, or maybe the maps they had available weren't as accurate as what we have, today.

The nearest rail head that connects to Lima west of Rimac is Cuzco. The dark line shown on the map indicates a possible route for the new rail line, but interestingly, transportation out of Rimac would be by water via a tributary of the *Rio Madera*. There is no rail route shown into or even near Rimac from the Bolivian side, even today in 2005.



Lima to Rimac, Peru.
Map courtesy of Microsoft Map Point.

A Google search for the term "Pelone," turned up the following website:

<http://www.tsha.utexas.edu/handbook/online/articles/view/PP/bmp55.html>

It would seem that "pelone" is not a city in Peru, but Spanish slang meaning "hairless or bald," usually applied to the Indian tribes of northern Mexico and southern Texas that shaved their body hair. These tribes included, but were not limited to the Carrizone, Lipan Apache, and Jumano peoples.

Lamos is the son of Zeus, and a river god who is father to the "river-nymphs" also called the Hyades.

JP Karenko, 3/17/2005. Revised and expanded 8/21/05

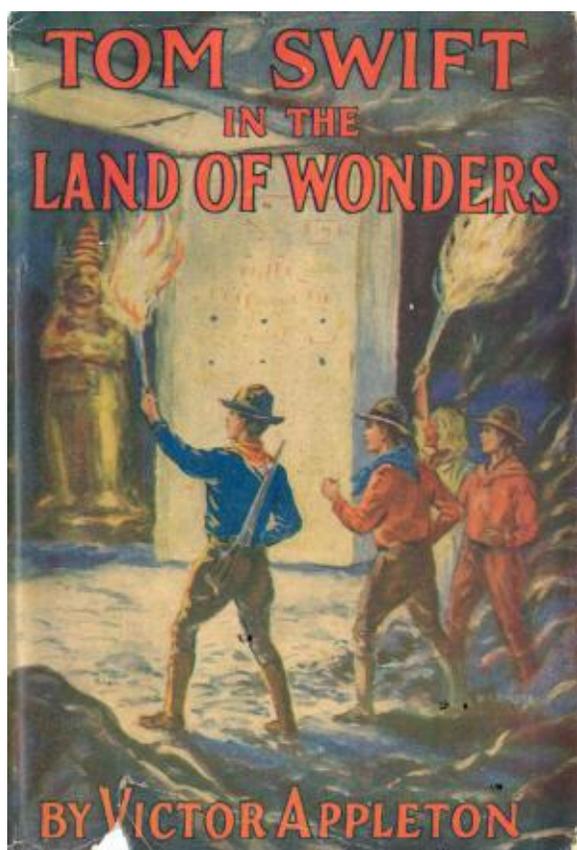
#20. Tom Swift In The Land of Wonders (1917)

Or, The Underground Search For the Idol of Gold

Review by JP Karenko, August 2005

Full-color image from the collection of James D. Keeline

White Quad and Duotone image from the collection of Mark Snyder



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

The story begins with the usual conflict: Tom has had enough of adventure and swears he is going to stay home and live the life of a sedate scientist, working on his many patent applications. He spots a magazine article written by Professor Bumper (See *TS & Big Tunnel #19*) describing a fabulous underground city containing a large gold idol. Tom's attitude is "Hrumpf! Gold. Underground city. Savages. Lions. Tigers. Bears. Been there, done that." Next thing we know, Professor Bumper and Mr. Damon show up. It takes about 4 pages to turn Tom around, but not for the usual reasons (i.e. wealth, fame, glory and excitement.) It seems a young, handsome, rival archeologist--one Professor Fenimore Beecher--is also interested in said idol. His plan is to give a part of it to Mary Nestor, Tom's sweetie. This is as an enticement to upgrade her betrothal to a *real* professional--none of this common inventor stuff. Jealousy rears its' green-eyed head, and we are shortly thereafter off, willy-nilly, to the land of big alligators and bigger mosquitoes.

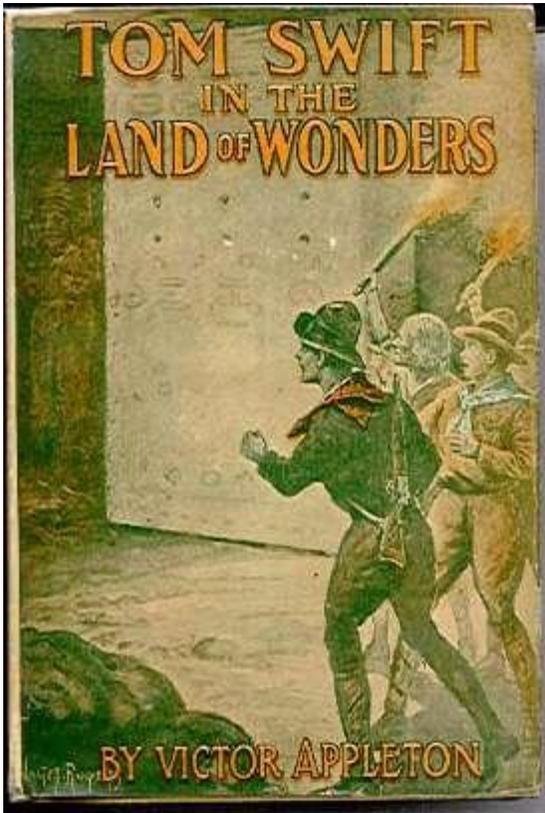
The story is nearly a rehash of the *City of Gold*, except the personal issues eclipse mere avarice in this tale.

Cast of Characters (More or less in order of appearance)

Tom Swift--Intrepid Inventor, Hero, and now, betrothed love interest of Miss Mary Nestor.

Ned Newton--Chum & constant companion of Tom, has given up his position at the bank to become both financial advisor for the Swifts and CFO of *Swift Construction*.

Professor Swyington Bumper--Originally introduced as a bald, skinny, short and semi-bumbling archeologist/quintessential mad-scientist type, he is now apparently taking his AADD medications regularly. In this tome he is now quite focused, no longer scatterbrained and easily distracted. Actually sounds learned, most of the time.



Mr. Wakefield Damon--Elderly & eccentric adventurer and traveling companion of Tom & Ned, whose main purpose in life seems to be blessing everybody and everything near his person.

Mrs. Baggert--Housekeeper. Kindly, and "loves Tom like a son." Employed by the Swift family for 15+ years at the time of this story. She is short of stature and has to stand on a soap box to kiss Tom goodbye on one of his voyages.

Professor Fenimore Beecher--Young, handsome & unscrupulous. Professional rival of Prof. Bumper. Acquainted with Nestor family. Has designs on Mary.

Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited mental facilities. Antagonist and rival of Eradicate.

Eradicate Sampson, A.K.A. Rad--Aged stereotypical Negro manservant given over to the ravages of advanced age as he is an ex-Civil War Era slave. Constant antagonist of Koku. His faithful mule **Boomerang** is not mentioned in this episode.

Barton Swift--Widower. Wealthy and conservative. Inventor master machinist and holder of numerous patents. Mr. Swift, has failed in his health and is described as "old and feeble." Walk-on part in this tale.

Miss Mary Nestor--Love interest of Tom. Plucky, courageous, intelligent and engaged to Our Hero, since 'plans' regarding Tom are mentioned. The Nestor family previously resided in Mansburg, but apparently have now moved to Shopton.

Mr. & Mrs. Amos Nestor--Mary's parents. No descriptions given. Mrs. Nestor's first name and description are never mentioned. Amos is apparently quite excitable and jumps to bad conclusions about Tom, in spite of having had his life saved by Tom in both the *Wireless Message* and *Wizard Camera* adventures.

Officer Newbold--NFN or description. Shopton beat cop. Assumed Irish and burley from combination of mild brogue and stereotype. Passing mention.

Cousin Myra--NLN or description. Relative of Mary Nestor. Resides in Fayetteville. Passing mention.

Crewmember, *SS Relstab*--Distinguished only by being lost overboard in a Caribbean gale.

Senor Val Jacinto--Spaniard with brilliant white teeth and black moustache. Hired by Prof. Bumper as guide and labor leader for jungle trek. Treacherously abandons Tom & Co. up a river without a paddle, or a boat to use it in, either. Originally thought to be in the employ of Prof. Beecher, he is later found to be a simple mercenary and thief.

Senor Alligator Bait--Indian porter. No name or description given. Killed by alligators after falling out of boat. Tom attempts to save him with *Electric Rifle*.

Senor Tolpec--NFN or description given. Indian porter, brother of Sr. Alligator Bait. He defects from Jacinto's camp and helps Tom & Co. find civilization after they are abandoned in jungle. Grateful for Tom's attempt at saving his kin.

Host of Indian Porters--Members of Tolpec's tribe. Extras.

Tal the Tiger Treat--Indian laborer working for Prof. Beecher. Saved from a hungry leopard by Tom using the *ER* again.

Valdez the Sneak Thief--Indian laborer working for Prof. Beecher.

Goosal--Grandfather of Tal's wife. Indian wise-man who has been to the underground city.

Professor Hylop--NFN or description. Professional rival of Prof. Bumper. Vindictive over an old sleight.

Mr. Hardy--NFN or description except "least disgruntled of Prof. Beecher's party."

Major Inventions:

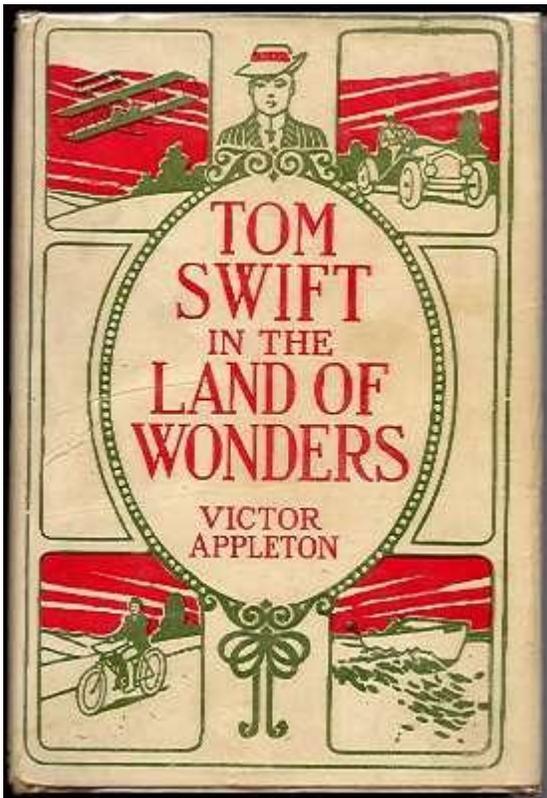
No new inventions were created or used in this tale. Tom is working on an unspecified gyroscope-based "aircraft stabilizer." This allows fighter plane pilots to keep control of their craft while attending to "war stuff," like shooting down other planes or bombing targets on the ground. It plays no part in the story.

The *Electric Rifle* plays a prominent role, dispatching various and sundry jungle critters. The author still will not explain how a snake can be electrocuted while leaving the victim trapped in its' coils unharmed.

Giant Cannon blasting powder is referenced, but not actually used in the story.

Commentary on Society, Attitudes, Environment & Errata

Reading the old Tom Swift Sr. series has really given me an appreciation of the modern gadgets that I've come to take for granted. It also has given me a grasp of just how technologically and culturally unsophisticated the average reader was in the early 1900's.



Attitudes and Prejudices: Tom and Ned start this tale speaking in strings of (then current) slang. This goes on for several pages, until I presume the author has satisfied himself that the youthful reader of this tale considers him "cool" or "hip" or whatever passed for such things, then. Language reverts to "normal" after this initial foray. Koku's language, which changes dramatically from episode to episode, stays "Hollywood dime-store injun." We do find out that he is terrified of water and/or anything living in it. (Imagine a simple Crawdaddy causing a 9 foot 400lb giant to have a panic attack.) We also find that Eradicate can't stand bugs that bite. Extra-large mosquitoes are enough to keep him from coming along on this jungle trek. (I wouldn't want Yellow Fever or Malaria, either.) The authors have also discovered a new word-ejaculate. Most times the characters "cry" when excited. In this tome, verbal exclamations are "ejaculated." (I wonder if this is a gag to get around a bowdlerizing managing editor?)

Tom's personality faults are once again dragged into the light of day, as he demonstrates a severe jealous streak and wants vengeance against a rival male sniffing around his woman. There is also much ado about "rights" and proper conduct regarding who finds what and when, treasure-wise. On the other hand, when the bad-guys get to the treasure first, rights go out the window and Tom is ready to use armed force to displace the victors. This is in spite of the stated fact that "Tom harbors no enmity toward them."

Errata: Mr. Damon is first relegated to residing "in a nearby town." (After four books in a row in *Waterford*, NY, the author apparently forgot where he lived in the previous volume.) This tale moves him back to *Waterfield*, making the current tally of his many moves between *Waterford* and *Waterfield* stand at 10-*Waterfield*, 3-not recorded, and 9-*Waterford*, for 20 volumes, to date. The numbers don't total, because two volumes have him residing in *both* places at the same time. Three others (including this one) either do not specify a town name, at least initially, or have multiple references.

There were no typos or malapropisms found in this tale. Uncharacteristically good editorial care for a story-mill like G&D at the time. Most of these books read like they were thrown together overnight, but not this one.

One coordination issue had to do with reference to a previous episode (the *Big Tunnel* .) It was stated that Tom & *Ned* were saved from a bomb by Prof. Bumper, when it was Tom & *Mr. Titus*. Ned had been recently promoted at the bank and was not present during that tale.

Prof. Bumper was said to have used Cyanide to dispatch entomological specimens. Considering the risk to the dispatcher, I'd think the more common Ether would have sufficed. The Cyanide was said to cause a "painless death." Anyone who knows about the effects of Cyanide on a living organism knows it is *anything* but painless.

Vampires: Oh, where is Buffy when we need her??? Our Heroes suffer the ravages of a typical Hollywood bat-attack. Large, vicious, bloodthirsty, yadda-yadda. A 1 ounce *Fliegenmaus* with a 6 inch wingspan is only terrifying if you are up late drinking and watching old Bela Lugosi movies. Vampire bats do bite, but any given critter will only drink about 2 tablespoons of blood in a single sitting--and then only if undisturbed. The bites do look nasty, though, and can become infected. Disease is the real villain, here.



Desmondus rotundas

A face only a Transylvanian could love...

Engineering and Science, Fact vs. Fantasy: In addition to the boa constrictor Tom zaps with his magic rifle, a number of river reptiles are electrocuted *while in the water* without harm to their human prey. Another issue has to do with the ER's effectiveness. Previously, a "maximum charge" caused no less than a whale to "disintegrate" Now, it takes 5 shots to kill the abovementioned boa, and several shots to finish a jungle cat that attacks a native, later in the story.

Once again, we have a gigantic city, buried more or less undamaged, by a landslide, earthquake or eruption. Clean streets, fresh air and intact artifacts abound. At least they didn't include the big rolling rock that blocked the entrance in the *Indiana Jones* movie-plus Tom apparently learns from his mistakes. This time, the secret entrance is blocked open so they have an avenue of retreat in case of disaster...



Images ©1981 by Paramount Home Entertainment

Geography: Once again, either the author had actually been to Central America, or at least had access to some good research material. The places (except the actual lost city) all exist, except for one minor bobble-Quirigua is on the Ecuadorian side of the border, not in Honduras, as is stated. See below, for a map of a likely route.

Investigators have not yet agreed upon the etymology of the word "Copan". Several translations have been offered regarding its meaning such as "bridge", "Capital of Co", and others say it comes from the Nahuatl language, and they add the ending "tl", thus converting it into "Copantl", which means "pontoon or bridge".

The Copan Valley is called the Valle de Reyes (Valley of Kings.) The old city (now a tourist stop) was a seat of Mayan government during the pre-Hispanic Mayan era. It is flagged, below as *Ruinas de Copan*.



Map of Honduras, Courtesy Microsoft MapPoint

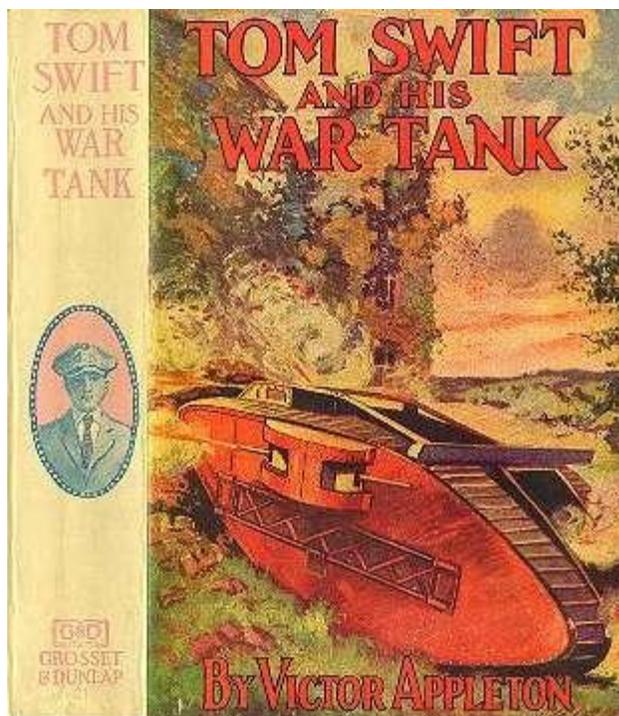
JP Karenko, 8/21/05

#21. Tom Swift and His War Tank (1918)

Or, Doing His Bit for Uncle Sam

Review by JP Karenko, August 2005

Duotone image courtesy of Mark Snyder



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

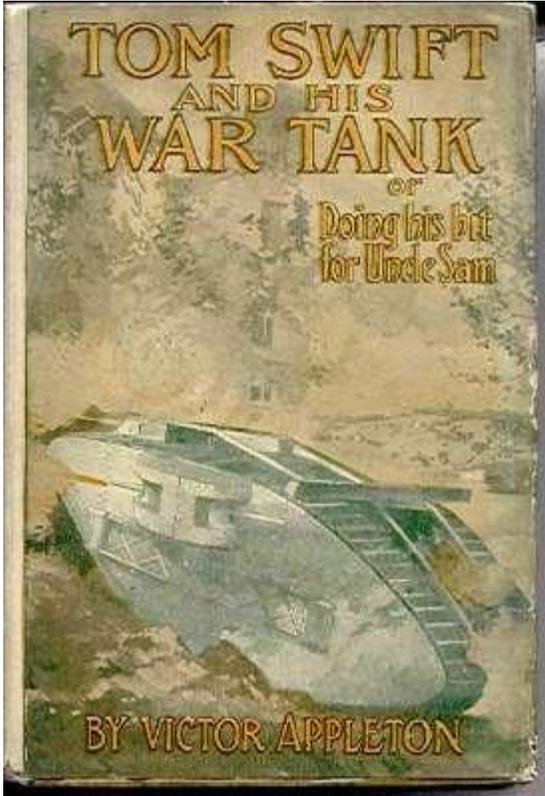
There is an oft repeated formula to this story. I wonder if some higher authority set it down or if it was just endlessly re-invented. War has come to Shopton. We begin with Our All-American Hero being maligned for malingering. Tom has not gone down to the local Army Recruiter and volunteered to become Bayonet Bait. As a matter of fact, he has actually appealed (to the President of the US, no less) for an exemption from military duty. Even his closest chum, Ned Newton speculates that he could be a "slacker." To compound this, he has gone all secretive about what he is doing in a large fenced-in yard that has been built on the Swift property. There are strange noises coming from the yard and German spies snuffling around everywhere, to boot...

All is not lost, as after about 50 pages of this nonsense, it is revealed that Tom has put his intellect to work at building a bigger, better, stronger and faster armored dragon to go slay the enemies of the Allies. *War Tank A* is revealed, and then the real fun begins. Espionage, subterfuge, assault, kidnapping and grand theft, are all on the menu. How and if the Good Guys prevail are all in the story.

Cast of Characters (More or less in order of appearance)

Tom Swift--Intrepid Inventor, Hero, and now, betrothed love interest of Miss Mary Nestor.

Mr. Wakefield Damon--Elderly & eccentric adventurer and traveling companion of Tom & Ned, whose main purpose in life seems to be blessing everybody and everything near his person.



Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited mental facilities. Antagonist and rival of Eradicate.

Barton Swift--Widower. Wealthy and conservative. Inventor master machinist and holder of numerous patents. Mr. Swift, has failed in his health of late, and much ado is made of his advanced age. Previously a doomsayer, he now seems to be able to assist Tom in developing details of his new war machine.

The Bearded Stranger--Later determined to be Blakeson (NFN) of *Blakeson & Grinder*, a construction firm that tried to sabotage efforts to build the *Big Tunnel* in a previous episode (#19)

Ned Newton--Chum & constant companion of Tom. Currently back to clerking at a Shopton bank. Has given up his position as Swifts' financial manager to sell Liberty Bonds in support of the war effort.

Eradicate Sampson, A.K.A. Rad--Aged stereotypical Negro manservant given over to the ravages of advanced age. Ex-Civil War era slave. Constant antagonist of Koku. In this episode, old and feeble. His faithful mule **Boomerang**, also getting old and cranky, helps corral a German spy.

Mr. (Amos) Nestor--Mary's father. No description given, except he smokes cigars. Amos remains excitable and is continuing to jump to negative conclusions about Tom, in spite of having been saved by him in both the *Wireless Message* and *Wizard Camera* adventures. In this tome, he speculates that Tom is a "slacker." Our Hero has not volunteered to don khaki and Go Get Killed, as all the "sensible" able-bodied males in town have done. Mary's mother has never been described or named, and is not even given passing mention in this tale.

Miss Mary Nestor--Love interest of Tom. Plucky, courageous, intelligent and apparently engaged to Our Hero, although no direct mention is made of this momentous condition.

Jennie Morse--No description given. Friend of Mary Nestor, and soon to be married.

Mrs. Baggert--Housekeeper. Kindly, and "loves Tom like a son." Employed by the Swift family for 15+ years at the time of this story. She is short of stature and has to stand on a soap box to kiss Tom goodbye on one of his voyages.

Miles--NFN or description. Loyal *Swift Construction* employee.

Harry Telford--Shopton youth. Caught snooping at Tom's Tank by Ned Newton. Last seen running scared in the general direction of his home...

The German Spy Ring:

The Moustached Stranger-AKA "Walter Simpson"--Well dressed, educated and authoritarian. Wears a mini "Kaiser" style moustache. Suspected German National. Brains of the outfit. At large.

Carl Schwen--No description given. Employed by *Swift Construction* as one of Tom's best machinists. German National caught spying by Eradicate, and given over to the tender mercies of the irascible Boomerang. Currently in custody.

Otto Kuhn--Swift employee who spies in collusion with Schwen, above. Currently in custody.

Crossleigh--NFN or description. Fourth spy-passing mention. At large.

Tom's Tank Crew:

Hank Baldwin--No Description. Chief tank mechanic.

The Little Englishman--No name or description. Knows about British tanks.

Assorted Crew--Extras.

Amos Kanker--Cranky, bearded, belligerent, bucolic farmer who causes trouble for Tom. Unwitting tool of German spies trying to steal the tank.

Helen Sever--No description, except likes chocolate. (I see large hips in her future...) Chum of Mary Nestor. Interested in Ned Newton.

Kent--NLN or description. Swift watchman. Drugged by spies.

Miss Blair--NFN or description. Swift phone operator.

Mr. Kimball & Son Bub--Local farm family. Find note from Tom and help effect rescue from kidnapers, late in tale. A Mrs. Kimball is not mentioned.

Major Inventions:

Hawk is a small, speedy 2-seat monoplane, capable of doing "spiral turns." (See Engineering Fact vs. Fiction)

A "large carburetor" is under development, that will allow alcohol, kerosene or gasoline to be used in an IC engine at will. (See Errata.)

"*War Tank A*" A bigger, better, faster & heavier Juggernaut than those in current use on the front lines. Twice the speed (12mph vs. 6mph) better traction due to increased weight (more than 42 tons) and able to leap a 20ft trench (as opposed to 12ft) at a single bound, by use of an-onboard bridging mechanism. It is powered by twin gasoline engines (See Errata) and has innovations such as dual steering systems, solid suspension and electrical communications between control & engine compartments. Large enough to carry "several" riflemen in addition to crew, it also has rudimentary living arrangements "in case of breakdown in no-man's land." Armaments limited to 4 machine guns: port & starboard, & fore and aft, and armor proof against a "Bertha Shell" or a "Jack Johnson." (See Attitudes.) Also capable of remote control by wireless.

Commentary on Society, Attitudes, Environment & Errata

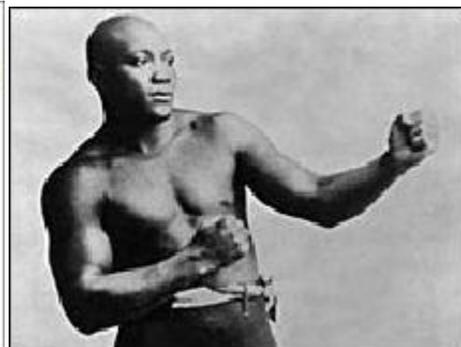
Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted. It also has given me a grasp of just how technologically and culturally unsophisticated the average reader was in the early 1900's.

Attitudes and Prejudices:

Weapons of mass destruction-1917 style. The "Bertha shell" references a cannon named "Big Bertha," named after Gustav Krupp's wife. This state of the art howitzer weighed 43 tons, and threw a truly impressive (for the era) 2,200 lb shell over 9 miles.



Big Bertha Howitzer



Jack Johnson, ca 1915

Jack Johnson, was the first black heavyweight champion of the world. His reign lasted from 1908 to 1915. He was also the first African American pop culture icon, and was photographed more than any other black man of his day. His name was synonymous with a "knockout punch."

I've concluded that Mr. Nestor is bipolar. One minute, Tom is a no-good slacker and the next he's "a wonder." I'm thinking he may be the Mother of all Father-in-laws...?

We are back to the British spelling of gasolene and clew. I'll have to assign nicknames to the various ghost writers that concoct these stories and keep score, like I have with Mr. D's hometown. This one is hereinafter called "The Brit."

War fever comes to Shopton. In this tale, the Germans are now "The Bad Guys." They are described with the pejorative names "boches," "fritzes," or "huns." It is now "the European War," reflecting America's still-not-quite-involved attitude.

Interesting note that Tom can go haring cross-country in his tank chewing up pastures, firing machine guns and demolishing buildings with abandon (or permission.) Seems it was easier to ask forgiveness, than get permission, even then...and just pay damages if anyone objected. Can you imagine having a thousand dollars for "pocket money" in 1917 dollars? Poor little rich kid...

Errata: Mr. Damon is first relegated to residing "in a nearby town." (After four books in a row in *Waterford*, NY, the author apparently forgot where he lived in the previous volume.) This tale moves him back to *Waterfield*, making the current tally of his many moves between *Waterford* and *Waterfield* stand at 11-Waterfield, 4-not recorded or confused, and 9-Waterford, for 21 volumes, to date. The numbers don't total, because two volumes have him residing in *both* places at the same time. Four others (including this one) either do not specify a town name, or have multiple references that change.

Engineering and Science, Fact vs. Fantasy:

Spiral Turns: *Hawk* apparently has newly discovered larger rear stabilizer planes. The early models of "aeroplanes" had woefully inadequate vertical and horizontal stabilizer surface areas. If the craft got into any extreme attitude, loss of control was almost guaranteed. Any pilot who wanted to die of old age (and many didn't) stayed out of violent aerobatic maneuvers, even one as tame as a "spiral turn." War changed all that.

Tank Troubles: Yes, tanks started out gasoline powered. Not for long, though. *Les Boches* found out rather quickly that gasoline vapors make pretty short work of Allied tank crew when sparked by even a simple rifle shot placed in the right spot. Then, there's the old leaky fuel line plus confined space plus smoke-'em-if-you-got-'em combination. The equation equals "poof-crispy critters in a can." Diesel engines were not long in coming, as it is harder to get Diesel vapors to explode. Also, it is easier (and cheaper) to refine Diesel fuel.



British Mk IV WW1 Era War Tank



Les Boches Stalking a British Crawler



My Kingdom for a Bazooka...

The above image shows some of the acrobatics that early tanks were capable of. Tom & Co. do a spiral roll in *War Tank A*, to right it after "turning turtle," by driving it up an embankment at an angle. With a solid, un-sprung suspension! Considering the crew was rattling around loose inside the can, unrestrained except

for grab rings, I think WW1 era soldiers were made of pretty stern stuff. You begin to wonder who suffered more, our guys or the enemy...

Carburetors for multiple fuels: Can be done, but Rube Goldberg would be proud of the result. The energy content of gasoline vs. kerosene vs. alcohol dictate *dramatically* different fuel flow rates, plus the "safe" aspect of Diesel (it is hard to explode) makes using a carburetor counterproductive. Fuel injection (not invented for a few years, yet) is the way to go for this set up.

Armor: Tom's tank is said to be built to stand up to a "Bertha Shell." 2200lbs of high explosive, armor piercing artillery would make short work of even a Swift-built crawler. The only way possible to survive one of these was to not be there when it arrived, or hope that the German gunners were poor shots. Not good odds, in my book.

Geography: Shopton is now home to Grant Army Base, where "bird-men" are being trained to fly. There is a new town named Sackett, nearby (I'm going to have to start on a Shopton county map, too...) as is "Tinkle Creek." We also find out that *Swift Construction Co.* actually makes things besides Tom's toys. Their manufactory produces "aeroplanes, submarines and tunnel diggers." (Most sub-building firms are located on ocean coasts-I wonder if there are U-Boats in *Lake Carlopa*???)

JP Karenko, 8/24/05

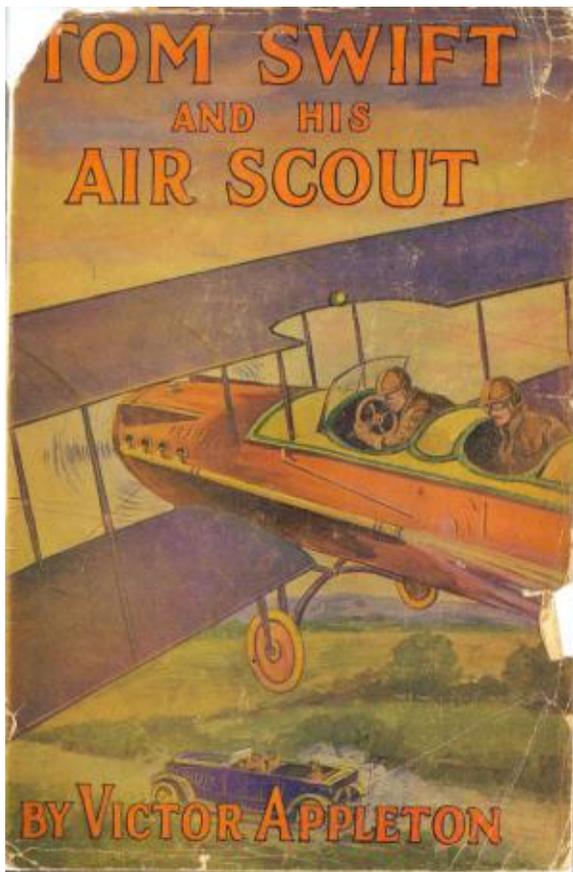
#22. Tom Swift and His Air Scout (1919)

or, Uncle Sam's Mastery of the Sky

Review by [JP Karenko](#), August 2005

Full-color image from the collection of James D. Keeline

Duotone image from the collection of Mark Snyder



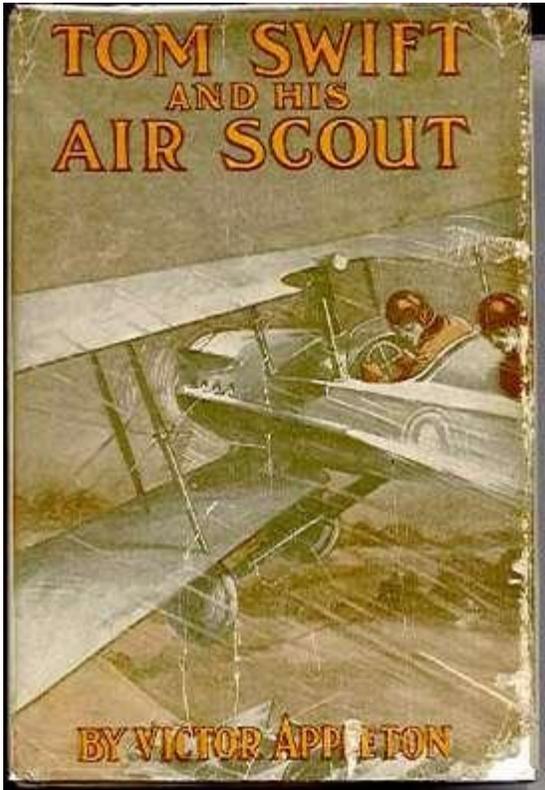
Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

The story opens with Tom spending 4 pages convincing Mary Nestor that it is "safe" to take an extended airplane ride with him. Once she is convinced and they are aloft, he finds that it is impossible to whisper sweet nothings to her over the "racket of the open motor exhaust." A flash of inspiration tells him that a "silent" aeroplane motor would be beneficial in advancing both the War Effort and Tom's Love Life. The craft then breaks down, seriously damaging Tom's credibility with Mary about the safety of air travel...

During the development of the several changes needed to silence a normally noisy aircraft power plant, Tom runs afoul of the *Universal Flying Machine Company*, a competitor for government contracts. Bribery, intimidation, espionage, threats, theft and kidnapping are all used against Our Hero to try and sabotage his efforts. How and if these threats are overcome you will have to read the story to determine.

Cast of Characters (More or less in order of appearance)

Miss Mary Nestor--Love interest of Tom. Plucky, courageous, intelligent and currently engaged to Our Hero. In this tome, she takes a reluctant interest in becoming an *aniatrix*.



Tom Swift--Intrepid Inventor, Hero, and now, betrothed love interest of Miss Mary Nestor.

Eradicate Sampson, A.K.A. Rad--Aged stereotypical Negro manservant given over to the ravages of advanced age. Ex-Civil War era slave. Constant antagonist of Koku. In this episode, he is old and feeble, and he spends so much time antagonizing Koku, Tom actually becomes vexed with him. His faithful mule **Boomerang** is also getting old and cranky, but has only passing mention in the story.

Jackson--NFN or description given. Ace Swift mechanic and gofer. (Too young to be Garrett Jackson, the old engineer from episodes 1-5. Perhaps his son?)

Mr. Wakefield Damon--Elderly & eccentric adventurer and traveling companion of Tom & Ned, whose main purpose in life seems to be blessing everybody and everything near his person. Short and stout, but spry for his age.

Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited mental facilities. Antagonist and constant rival of Eradicate. Still

massacres the English language after 7 years of living in the US.

Mrs. Baggert--Housekeeper. Kindly, and "loves Tom like a son." Employed by the Swift family for nearly 20 years at the time of this story. She is short of stature and has to stand on a soap box to kiss Tom goodbye on one of his voyages. Apparently starting to show her years, as a "new maid" has been hired to assist in keeping the Swift Household in order.

Peton Gale--Well-dressed, prosperous, pompous, with an insincere laugh. President, *Universal Flying Machine Company*. (UFMCO) Tries to hire Tom.

Boland Ware--Well-dressed. No other description. Treasurer, *Universal Flying Machine Company*.

Barton Swift--Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. Mr. Swift, has failed in his health of late, and much ado is made of his advanced age and health. Still able to kibitz Tom's ideas.

Ned Newton--Chum & constant companion of Tom. Currently back to clerking at a Shopton bank. Has given up his position as Swifts' financial manager to sell Liberty Bonds in support of the war effort. Now has "an important position" at said bank.

Mr. (Amos) Nestor--Mary's father. No description given, except he smokes cigars. His first name is only known because it was mentioned in a previous volume. No character development at all, in spite of having a key role in this tale. Kidnapped by *UFMCO* agents.

Bower--NFN or description. New *Swift Construction* mechanic. Quiet & efficient. Actually an employee of *UFMCO* working as a spy/sneak thief for them.

Lydane, the Gold Tooth Trespasser--NFN or description. An employee of *UFMCO* working as a spymaster for them. Imprisoned.

Mrs. Nestor--NFN or description, in spite of having a major role in this tale.

Mr. Millard--NFN or description. Supervisor at Shopton hospital.

Mary Nestor's Aunt--No name or description, except "a happy person."

Unnamed Physician--No name or description. Ministers to Mary's Mother.

Farmer Bloise and Son--No names or descriptions. Helps out Tom when he is stranded out in the boondocks after a forced landing.

Blair Terril--No description. USG Agent. Confusion as to whether he is only "War Dept. Army Aviation Agency" or also a Secret Service Agent.

Unidentified Co-Conspirator--Working with Lydane, above, for *UFMCO*. Imprisoned.

Major Inventions:

Silent Sam is the generic name given to several aircraft using Tom's new silent power plant. The silencing method consists of a modified propeller, an external muffler and unspecified changes to the engine's cylinder compression. These changes, while unspecified, were probably related to camshaft, valve and ignition timing. The muffler device is a Vanadium Steel tank with "pipes, valves, baffle plates, chambers, cylinders and reducers. These "eat up" the hot exhaust gasses and reduce the "racket" the motor makes. Sam is said to be "quiet as a swooping Owl." (See Errata.)

Barton Swift's gyro stabilizer (finally perfected after many years of development) is also installed to make *Sam* more easily controlled by the pilot.

Commentary on Society, Attitudes, Environment & Errata

Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted. It also has given me a grasp of just how technologically and culturally unsophisticated the average reader was in the early 1900's.

Attitudes and Prejudices: The World War is now named as such, rather than as the term "the European Conflict," used previously. "Things are getting pretty hot," is the description of the current level of conflict. The numerous German spies lurking around the Swift premises in the previous episode, all seem to have gone elsewhere or been captured and incarcerated. The bad-guys in this tome are mere All-American industrial espionage agents, working for a rival manufacturing firm. Tom's War Tank is barely mentioned in regard to the effort *Swift Construction* is making toward the war effort. Liberty Bond sales and Red Cross work is made much of, but Ned (selling the bonds) seems to have plenty of spare time to hang out with Tom. This may be because he is also surveilling and reporting on Tom's activities to the War Department.

The Nestors are sufficiently wealthy that they employ at least one maid.

Errata: After four books in a row in *Waterford*, NY, the author has now left Mr. Damon in *Waterfield*, for the second time, making the current tally of his many moves between *Waterford* and *Waterfield* stand at 11-*Waterfield*, 4-not recorded or confused, and 10-*Waterford*, for 22 volumes, to date. The numbers don't total, because two volumes have him residing in *both* places *at the same time*. Four others either do not specify a town name, or have multiple references that change.

There were no typos or malapropisms noted. One factual error was noted in that Ned was said to go on the *Submarine Boat* (Vol #4) Ned played only a passing role in that adventure, and did not go on the voyage.

The author still uses "clew" "moor" and "Jove," leading one to conclude that he is at least part English. He is not "The Brit" from *War Tank*, though. The rest of the language used is 1910-style Modern American. I'd be tempted to nickname this author "The Import."

Engineering and Science, Fact vs. Fantasy

Tom "hits an air pocket" while on a plane ride with Mary, and a control is disabled. Tom replaces it with an auxiliary while in flight, which seems farfetched. Fur-lined leather "flying togs" are now *de rigueur* for travel in "the cold of the upper reaches." Previously, flying was a shirtsleeve event, with goggles being the only required safety equipment. Seat belts are now used, and a well-defined engine starting procedure with switch on contact steps is used.

Having the muffler develop a leak is said to cause a loss of control in the airplane. It is said that "the equilibrium would be upset, causing the craft to turn turtle or loop the loop." No reason why was given, and I'm having a hard time thinking of a justification for this statement.

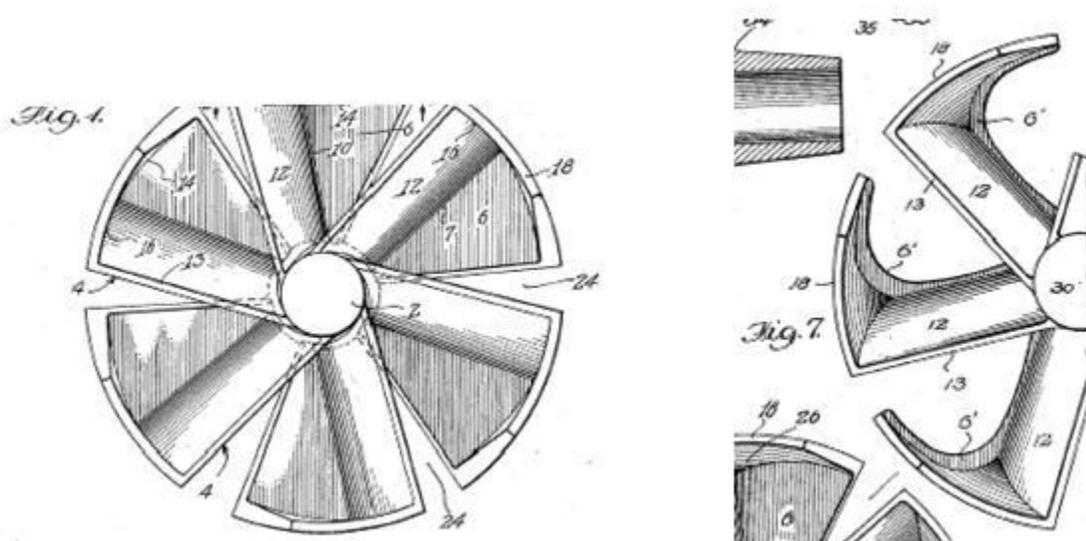
Automobiles now have foot-operated accelerator pedals and "tonneaus." Technology is advancing rapidly, outside of Shopton, too.

Sam is said to be "quiet as an Owl, swooping down from the upper regions." Owls are mighty quiet, due primarily to the configuration of their wing feathers. Tom's changes don't address mechanical clatter in the engine, motor mount isolation or natural frequency reverberation issues. These would need to be addressed, as would the whine of "wind in the wires" that occurs when guys and stays get above a certain air speed. Except for exaggerated claims, like the one above, I figure this "invention" is the most likely to exist in a real world.

Even with a 50 year jump on technology, today's light aircraft are still noisy enough at anything above cruise power levels to make conversation difficult over the engine (primarily prop) noise. Today's pilots wear headphones to hear ATC directions clearly.

A Proper Propeller

Below are two illustrations from a patent application filed by one Christian Volf in 1932 for a "silent propeller."



Volf Silent Propeller US Pat 1,873,853

Seeing through the rotating prop if it were this style, would be very difficult.

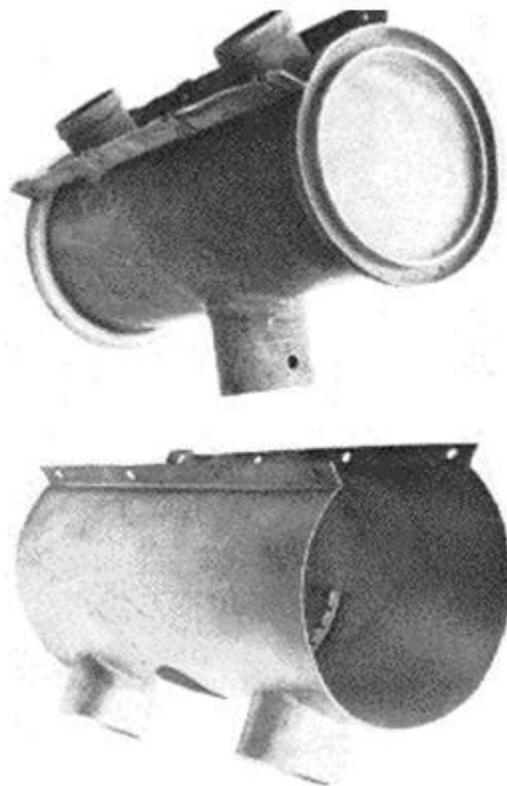
Muffler Magic

A standard muffler consists of a tube of some specific length and diameter. It is usually a rather large stainless steel tube and may or may not have built-in internal baffles. The practice has long been to construct aircraft mufflers with baffles and with the inlet and outlet tubes staggered. In some mufflers, the exhaust gases are forced to change direction drastically in their pell-mell trip to the free atmosphere.

To construct your own muffler with similar baffles built-in, is a chore of questionable value, unless you have some relentless urge to experiment and to induce forced labor. The practical thing to do would be to omit the baffles completely, as they usually are the first area of failure in the exhaust system. Burned, disintegrated or collapsed baffles in standard category aircraft often obstruct the flow of exhaust gases and have been known to cause serious loss of power or engine failure.

Mufflers are most effective when they are located as close to the exhaust outlet of the cylinder as it is practical to place them. The Cessna 150 provides an example where this concept is effectively practiced. Its individual mufflers are hung on each side of the engine on short exhaust risers. In some Piper models, too, the cross-over system mufflers, are integrated as far upstream as possible.

As for the muffler size, the Cessna muffler is about 10 cm by 25 cm. (It looks bigger with the shroud around it.) These are really the minimum size for the muffling job at hand. Actually, a muffler measuring 15 cm by 25 cm, would be much more effective. With due regard for the extra weight and lack of space under the cowling, your own muffler(s) should be as large as possible - something on the order of at least 4.4 liters, if at all possible.



The popular Cessna 150 muffler and shroud

Forget about internal baffles, as their usefulness is questionable when everything is to be considered. Instead make the diameter as large as you can manage. A good length of tail pipe downstream from the muffler, will increase its effectiveness noticeable and will assist in smoothing out the pulsations of the exhaust gases.

Geography: In this tome, *Swift Construction* is back to being primarily a prototype shop. Rad's living quarters (humble, but comfortable) are now in a loft over Boomerang's stable. Previously, he had an "apartment" in the Swift Manse. The Nestors' home is said to be about 3 miles from Tom's house, "in a suburb of Shopton." There are only 2 hospitals in the area. The one in Shopton is private. The other is in Waterford. Centerford, (previously spelled Centreford and about 50 miles in the direction of Albany) is the nearest large city. Previously it was Mansburg. The Alexian Brothers are said to maintain a sanatorium, there. In reality, the nearest Alexian facility is a hospital in Elizabeth, NJ.

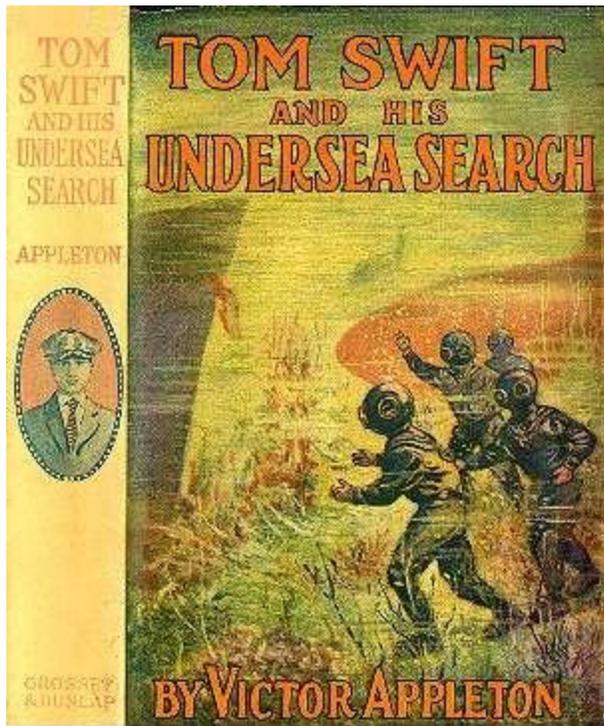
JP Karenko, 8/30/05

#23. Tom Swift and His Undersea Search (1920)

or, The Treasure on the Floor of the Atlantic

Review by JP Karenko, September 2005

Duotone image from the collection of Mark Snyder



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

Times have changed. The Great War is over, and money is getting hard to come by. Mr. Damon shows up with a new friend, who promises wealth from the bottom of the sea. Tom reluctantly agrees to join the search for the sunken steamship *SS Pandora* and a million dollars in gold coin.

Like the Greek legend, the strong box on the *Pandora* contains much more (and less) than the treasure seekers expected.

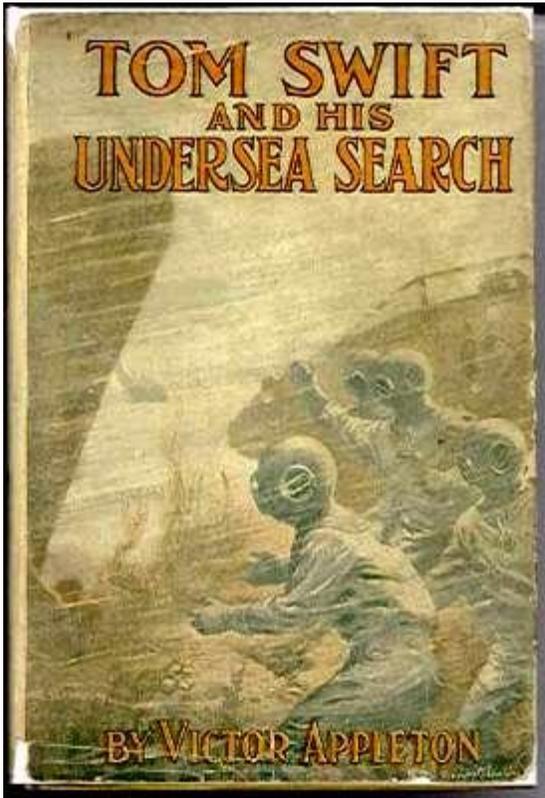
The usual Hollywood undersea hazards abound, including encounters with various dangerous denizens of the deep and demographic details. The captain of the sub keeps running into things—mostly, the bottom. (He must have been taking piloting lessons from Mr.

Damon...)

How the story ends, you will have to read to find out.

Cast of Characters (More or less in order of appearance)

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. Is a decent cook, too.



Ned Newton--Chum & companion of Tom, No longer employed as a cashier at Shopton National Bank. He has once again resumed his position as Swifts' Financial Manger.

Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited cognitive facilities. Described as "simple and child like," he is antagonist and rival of Eradicate. Previously said to be terrified of water and anything living in it, Koku dons diving gear and battles a giant starfish attacking Ned Newton with aplomb (and an axe...)

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. Apparently quite wealthy.

Dixwell Hardley--No physical description. Full of himself, pompous and cowardly. Suspected scammer and con-artist.

Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro journeyman jack-of-all-trades. "Eradicates dirt." Now is suffering the ravages of old age, including difficulty moving and "having de misery in his back." Described as "tottering, Eradicate has now "become too old to do much," but remains faithful to Tom and helps out where he can. His mule **Boomerang** has passed on and gone to that big pasture

in the sky.

Miss Mary Nestor--Betrothed love interest of Our Hero. Described as a "fair young woman with flashing brown eyes." Blushes easily, especially around Tom.

Mr. and Mrs. (Amos) Nestor--the parents of Mary. Passing mention. In spite of having sometimes major roles in these stories, Mary's parents are never described and her mother's name has never been mentioned in over 20 books to date. Mary's Dad, (Amos) had his name mentioned in only 3 volumes, and no description, to date.

Barton Keith--Maternal Uncle of Mary Nestor. Wildcatter and speculator in western oil resources. Swindled by Dixwell Hardley out of rightful interest in a rich oil field in Texas. Ill and despondent.

Unnamed Nurse at Keith Residence--No name or description. Caring for Mr. Keith while he is ill.

Crew of the Submarine MN-1--(formerly the *Advance*.) All are Swift employees.

Captain Nelson--Commander of the boat. Runs into stuff a lot.

Barnes--NFN or description. Generic crewman.

Nash--NFN or description. Generic crewman.

Norton--NFN or description. Generic crewman.

Earle--NFN or description. Chief of the engine room.

Wyeth--NFN or description. Machinist.

Little Englishman--No name or description. Could be the same guy who was tank crew in volume #21, *Tom Swift and His War Tank*.

Major Inventions:

The submarine is the invention of choice in this tale. The old *Advance* (See Vol. #4) is dusted off, refit and "improved." The hull is strengthened, the interior rearranged, side fin keels and "double acting" rudders are installed. An underwater version of the *Giant Searchlight* is mounted and improved navigational gear is used when "shooting the sun." The newly refurbished craft is renamed the *MN-1*, after a certain young lady with the same initials.

The "peculiar plates" that made the original sub unique no longer are used, as the power-plant seems to be conventional twin-screw diesel-electric like every other sub afloat at the time.

Much ado is made of an open-bottom diving bell that is now fitted, but it never plays much part in the story. Nelson, diving bell, submarine (*Seaview*)...Connection?

Commentary on Society, Attitudes, Environment & Errata

It's amazing how much technology and society have changed. Reading the old Tom Swift Sr. series has given me an appreciation of modern gadgets that I've come to take for granted. Society's attitudes have changed, greatly, too. I wonder what people will be taking for granted 100 years from now, and what they will think of our "modern" society and its' mores (or lack of them...)

Attitudes and Prejudices: Language usage was interesting: It seems less "folksy" and more modern, but without the extensive slang used in the previous volumes. Tom is said to be "cool as a cucumber"

under stress, but Ned then wonders why cucumbers are considered cool? ...Good question. Ned "ejaculates" once, making me think this author is the same one who wrote *Land of Wonders*.

Ned is also back in the saddle as CFO at *Swift Construction*, which has grown explosively since the end of the war. He actually seems to have some business related duties that occupy at least part of his time, too. We now hear that Shopton is named for the "many shops at the Swift works." Hm! Seems I remember Shopton was there long before Tom started tinkering with a simple motor-cycle in his garage, a few years back...

Ned has now been determined to have a "horror of large fish," and of course, has a run-in with several while EVA, undersea. Koku, on the other hand, who previously was described as "terrified of a simple crayfish," is quite at home in hard hat diving gear, at 500 foot depth. He does a Norman Bates routine (with an axe, no less) on various giant undersea critters that attempt to molest his friends. Go figure.

On p189 Mr. Damon is said to "not approve of any form of gambling." Interestingly enough, he is always ready to speculate in various stocks and get-rich quick schemes, and has to have Tom pull his chestnuts out of the fire, repeatedly. I guess playing the market isn't considered gambling?-Wait 'til 1929 rolls around, guys...

Barton Swift has now "all but retired from the company" due to his age and health, and "has made his last extended journey" with Tom & crew. Passing mention in this tale.

Errata: After four books in a row in *Waterford*, NY and two more in *Waterfield*, in this tome, Mr. Damon's home town is not mentioned, making the current tally of his many moves stand at 11-Waterfield, 5-not recorded or confused, and 10-Waterford, for 23 volumes, to date. The numbers don't total, because two volumes have him residing in *both* places *at the same time* and five others either do not specify a town name, or have multiple references that change.

There were actually a few typos found in this volume, the first ones in some time: On p43, a messesnger (messenger) shows up, on p82 it seem(s) hopeless, and on p125 a lone (long) pole is used.

The format of my edition of this book is different from my other brown quad G&D editions. The typeface is smaller and the covers seem less substantial. This may be reprint done during the depression years when things were rough and quality materials were not affordable.

Some factual stuff is also confused. The wreck of *Boldero* (See Vol. #4) is said to be off the coast of Cuba. In the book, it was in deep water (15,000ft) off Bolivia. The illustration on the frontispiece shows the divers in their self-contained suits *sans* air tanks or the steel stiffeners that make the suits semi-rigid. Tom uses his "doubly charged" *Electric Rifle* to dispatch a marauding <sic> starfish wrapped around Ned Newton without the least harm coming to Ned. The electric charge is now a straight-line ray, a la Buck Rogers, instead of the previous plasma bullet. I'm not sure I'd want to be on either end of that underwater discharge...When the air goes bad, the crew seeks relief by laying on the floor of the sub "where the air is fresher." Considering they were trying to escape carbon dioxide, which is heavier than air and sinks, this bit of effort would have exacerbated their situation.

Engineering and Science, Fact vs. Fantasy: The *MN-1* spends a lot of time blundering around the sea bottom, running into things. Of all the improvements Tom could have installed, better steering, charts and navigational gear should have been at the top of the list. They run aground several times, and get the props tangled in seaweed large enough to stall the drive motors and require EVA to clear them.

Sonar Stuff

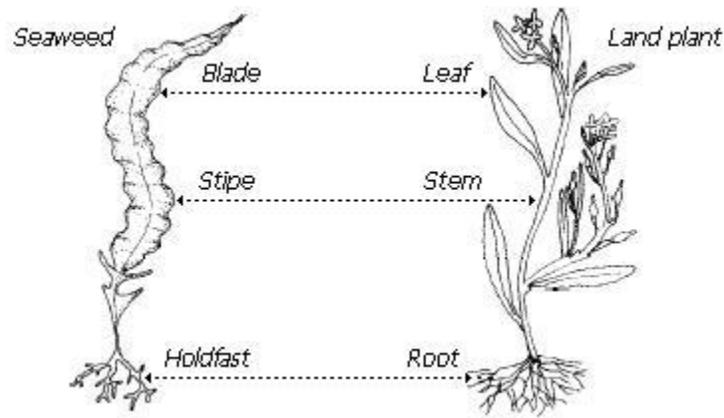
Lewis Nixon invented the very first Sonar type listening device in 1906, as a way of detecting icebergs. Interest in Sonar was increased during World War I when there was a need to be able to detect submarines. In 1915, Paul Langevin invented the first sonar type device for detecting submarines "echo location to detect submarines" using the piezoelectric properties of the quartz. While he was too late to help very much with the war effort, however, Langevin's work heavily influenced future sonar designs.

The first Sonar devices were passive listening devices - no signals were sent out. By 1918, both Britain and the U.S had built active systems, in active Sonar signals are both sent out and then received back. *Acoustic communication systems* are Sonar devices where there is both a sound wave projector and receiver on both sides of the signal path. The invention of the acoustic transducer and efficient acoustic projectors made more advanced forms of Sonar possible.

The *MN-1* could easily have had echolocation gear. The inter-suit "telephones" used during EVA may have been "current technology" rather than Swift-invented devices.

Seaweed Stuff

Light is a limiting factor in primary production (plant growth). In the near shore, light penetration is affected by the presence or absence of sediment in suspension and by the depth of water. In low energy coastal environments where sand and mud build up on the bottom or along the shore, waves, tides, and currents will throw these sediments into suspension. Run-off also contributes to the amount of sediment in the water. Clearer conditions exist off Newfoundland and the Atlantic Shore of Nova Scotia. Depth also limits the amount and type of light in the water. In the uppermost 15 to 20 meters, in clear water, longer wavelengths (reds) of light are absorbed; yellow light disappears by 100 m and green light by 250 m. This means that only certain seaweed will grow at specific depths. Large varieties would be possible, but very unlikely at the 750 ft depth stated.



Coral Reef Biology

Because of their dependence on light, corals require clear relatively shallow water. Thus, coral reefs generally are found only where the surrounding water contains small amounts of suspended material, i.e., in water of low turbidity and low productivity. Corals prefer waters that are nutrient-poor. Paradoxically, they are among the most productive of marine environments.



Corals' requirement for high light also explains why most reef-building species are restricted to the euphotic (light penetration) zone, approximately 60-70 m (less than 200ft depth) according to Lalli and Parsons, 1995.

Starfish Stuff

Starfish, or sea stars, are members of the same family as sea urchins. They are usually radically symmetrical, with five sections, or arms. At the end of the arms of some stars are small, light-sensitive pigment spots. The bottom of their arms are covered with many suction cup-like tube feet that they use to move. Starfish grip their prey with tube feet and pull open shells. Starfish insert their stomachs into their prey, where they

digest the food. Sea stars have the amazing ability to shed arms to escape from predators and then regenerate them later. They have small claws that cover their surface and prevent the settlement of other organisms.



Blue Linkia can grow to 12" diameter. (That's *inches*, not *feet*.)

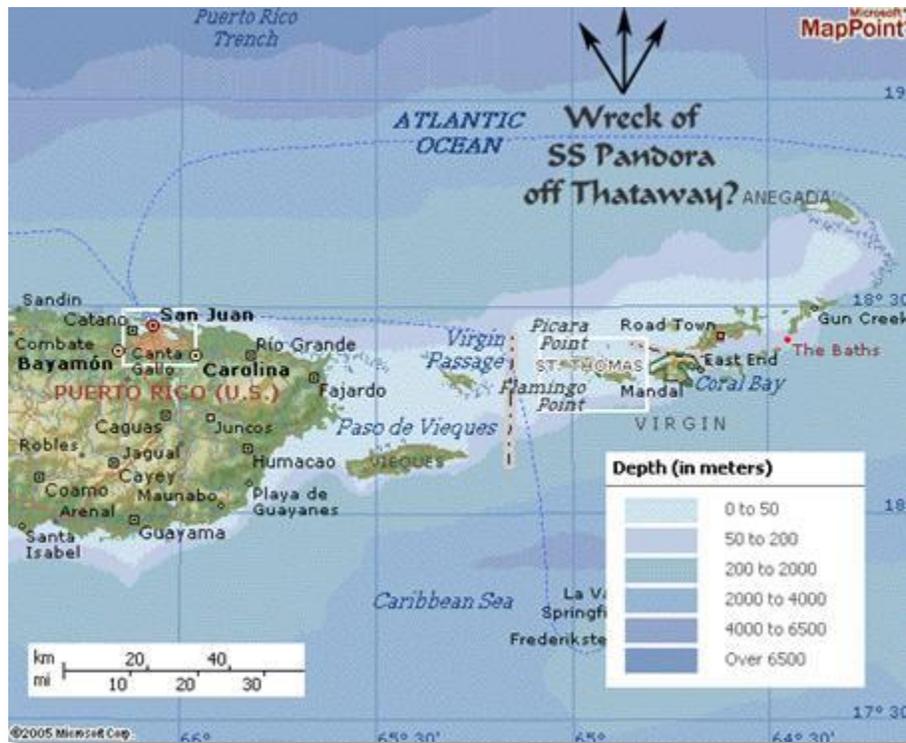
Ned's encounter was somebody's pipe dream. Then of course, things *do* look bigger under water...as far as being ambushed, an energetic inchworm could give a starfish a run for his money, speed-wise. A big squid would have made a better monster, but that critter was already taken in another book.

More Starfish Info

All of the various dangers faced in the book, could possibly have happened, (except the starfish) just not at the 700 foot depths stated to make the story more "fantastic."

Geography

And all I ask is a tall ship, and a star to steer her by... The ocean as described is more or less realistic except the depths at which all this adventure occurs and the size of the critters encountered. Below is the arena where the plot is laid out. It's "about 1 day's sailing from St. Thomas," but in an undisclosed direction.



Caribbean map courtesy Microsoft MapPoint.

More locally-Bailey's Corners is about 5 miles from Shopton, and the town of Bedford is noted to be 100 miles from Shopton. Swifts maintain a "submarine plant" on a river at the head of a bay. In one place in the story, impression is given that this river is near Shopton. No mention of Lake Carlopa is made, but this river seems to have access to the Atlantic Ocean.

JP Karenko 9/6/05

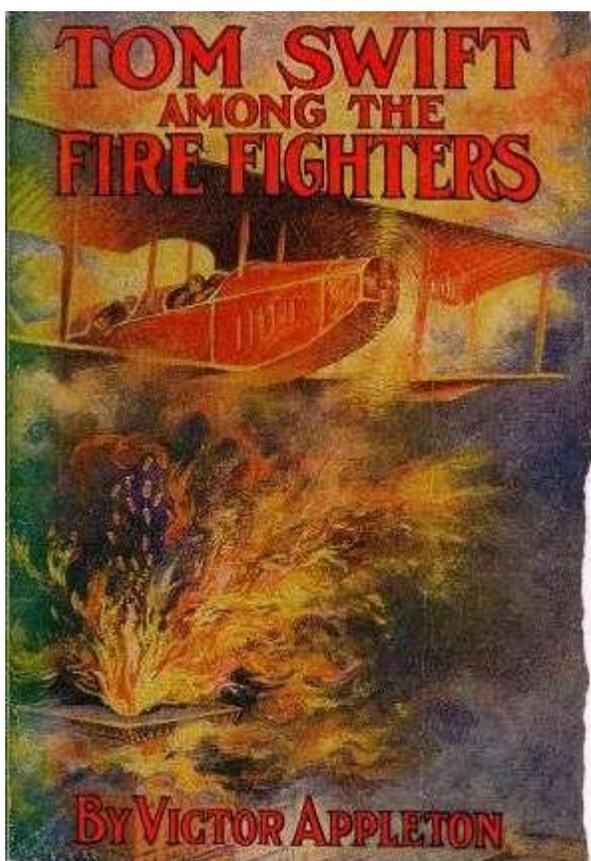
#24. Tom Swift Among the Fire Fighters (1921)

or, Battling Flames From the Air

Review by JP Karenko, September 2005

Full-color image courtesy of Carl Swanstrom

Duotone image courtesy of Mark Snyder



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

Upstate New York is suddenly in flames! The Shopton fireworks plant and a large lumberyard go up in a colorful display. A farmer's barn is set ablaze, boats and trees mysteriously burst into fiery bloom, and finally, a skyscraper in nearby Newmarket all provide fodder for Tom's latest brain-child, an aerial fire suppression system.

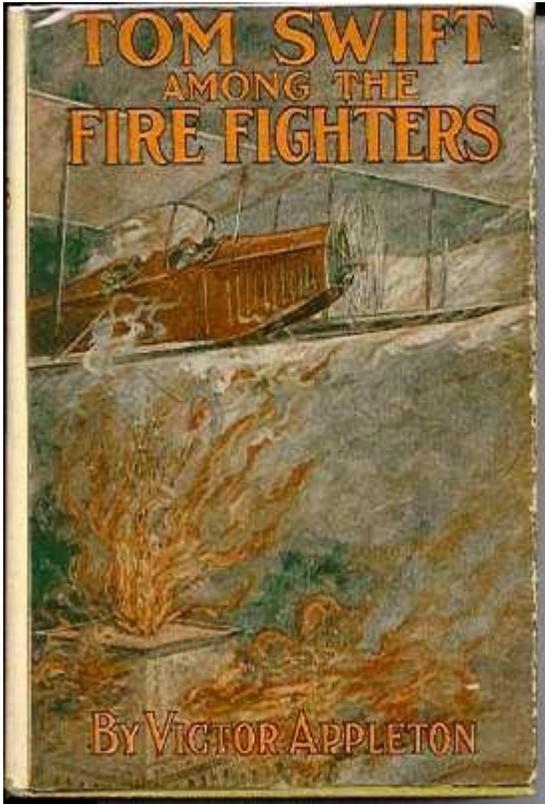
In addition to the trials of perfecting a new area of inventive endeavor for *Swift Construction*, human interest issues also abound. A research chemist, working on a new dye formula is swindled, Eradicate Sampson is severely injured in a chemical explosion, and Tom further ingratiates himself with the Nestor family, by rescuing not one, but two family members from fiery death.

How all this transpires, you will have to read the story to determine.

Cast of Characters (More or less in order of appearance)

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. Is a decent cook, too.

Ned Newton--Chum & companion of Tom. No description given. He has resumed his position as Swifts' financial advisor and CFO of *Swift Construction Company*.



Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro journeyman jack-of-all-trades. "Eradicates dirt." Now is suffering the ravages of old age, including difficulty moving and "having de misery in his back." Described as "tottering." **Boomerang**, his faithful mule, has passed on and gone to wherever good mules go after a long life. Eradicate has now "become too old to do much," but remains faithful to Tom and helps out where he can. Constant rival and antagonist of giant Koku.

Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited cognitive facilities. Described as "simple and child like," he is antagonist and rival of Eradicate.

Officer Cassidy--NFN or description. Shopton beat cop. Irish (of course...)

Miss Mary Nestor--Betrothed love interest who lives on the east side of Shopton, next to a large Flaming Fireworks Factory. Described as a "fair young woman with flashing brown eyes." Blushes easily, especially around Tom.

Mr. and Mrs. (Amos) Nestor--Parents of Mary. No first names or descriptions, in spite of ongoing, and sometimes major roles in these stories.

Shopton Firefighter--No name or description, other than possible cardiac problems.

Shopton Hospital Doctor--No name or description. Ministering to fire victims.

Josephus Baxter--Research chemist at *Shopton Fireworks Factory*. Despondent after fire destroys his lab at the fireworks plant.

Mrs. Baggert--Housekeeper. Kindly, and "loves Tom like a son." Employed by the Swift family for almost 20 years at the time of this story. She is short of stature and has to stand on a soap box to kiss Tom goodbye on one of his voyages.

Barton Swift--Widower. Wealthy and conservative. Inventor master machinist and holder of numerous patents. In this episode, he is described as "suffering the infirmities of age," Mr. Swift, has failed in his health of late, and is "all but retired from business."

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. Apparently quite wealthy.

GP Doctor--No name or description. First responder who treats Rad's eyes when he is burned in a chemical explosion.

Dr. Henderson, Oculist--NFN or description. Specialist called in to treat Rad's eyes.

Proprietress, The Meadow Inn Roadhouse--No name or description. Walk-on role.

Waiter, The Meadow Inn Roadhouse--No name or description. Walk-on role.

Amos Field--Small, short man with deep rumbling voice. Co-owner *Shopton Fireworks*.

Jason Melling--Large, tall man with squeaky voice. Co-owner *Shopton Fireworks*.

Mechanic, The Meadow Inn Roadhouse--No name or description. Helps Tom fix his disabled aeroplane.

Barton Keith--Maternal Uncle of Mary Nestor. Financier & businessman.

Deputy Chief, Shopton Fire Department--No name or description. Walk-on role.

Fish Bait Picnickers--No names or descriptions. Rescued from sinking boat on *Lake Carlopa*.

Uncle Jasper and Aunt Noname Blake--Mary's kin, living in Newmarket. Jasper is an antagonist of Barton Keith. Auntie is a faceless walk-on. See Errata.

Newmarket Fire Chief--No name or description. Impressed by Tom's Aerial Antics.

Newmarket Beat Cop--No name or description. Impressed by Tom's Aerial Antics.

Major Inventions

The *Scud* is a generic speedy aircraft. It is fitted with Tom's silencer system, a self-starter, and seems to have a cabin for comfort in travel.

Lucifer is Tom's aerial fire-fighting platform. It holds 4 passengers and sufficient extinguisher chemical to douse a large fire. A self-starter and Swift Silencer, plus dual controls are also mounted. The frontispiece illustration shows a bi-plane configuration, a la Curtis Jenny, but it must be much larger to hold 4, plus a bomb load.

Lucifer also carries a Swift designed analog bombsight that allows the accurate placement of the extinguisher bombs. The sight will compensate for altitude, A/C speed and wind. Possibly, this is the seed idea for the famous WW2 "Norden Bombsight."

References are made to a future "cabin airplane" and a "hydroplane" able to land and take off from open water. No parts are played in this story, but a *Flying Boat* turns up two episodes into the future.

Commentary on Society, Attitudes, Environment & Errata

It's amazing how much technology and society have changed. Reading the old Tom Swift Sr. series has really given me an appreciation of some of the modern gadgets that I've come to take for granted. Society's attitudes have changed, greatly, too. I wonder what people will be taking for granted 100 years from now, and what they will think of our "modern" society and its' mores (or lack of them...)

Attitudes and Prejudices: Language usage was "quaint." Alembic (a still used in chemical purification and concentration), Arnica (an herbal remedy used to treat sprains & bruising), and Murolla (a pastry) were all made reference to. "Taking a peep thru the hole in the grindstone" was one of the descriptive folksy tidbits quoted. Airplanes are no longer aeroplanes. Now, they have fuselages, carburetors (instead of carburettors) and make forced landings, rather than vol-planing. Tom's house still has a "piazza" instead of a porch, which leads me to think this author is the same one who wrote *Big Tunnel*.

I'm of the opinion that Tom's firefighting aircraft should have been named *Prometheus*, rather than *Lucifer*. *Prometheus*, the Greek god who brought mankind fire, also brought "signs in the sky." *Lucifer* brings nothing but chaos and evil. Plus, there's the "falling" part of fallen angel...

Errata: After four books in a row in *Waterford*, NY and two more in *Waterfield*, in the previous tome, Mr. Damon's home town was not mentioned at all. In this one, in one reference, Tom goes to Mr. D's home in *Waterfield*, but is said to have traveled from his home in *Waterford*, earlier. The current tally of Damon's many moves stands at 11-*Waterfield*, 6-not recorded or confused, and 10-*Waterford*, for 24 volumes, to date. The numbers don't total, because two volumes have him residing in *both* places *at the same time* and six others either do not specify a town name, or have multiple references that change. This one is classified as 'confused,' but leaning toward *Waterfield*...

Mary's Uncle Barton Keith is said to be her maternal uncle in the previous volume. In this tale, she also has another uncle and aunt named Blake. Auntie Noname must be the blood relative, but like almost all female characters (and virtually all medical professionals) in these stories, she is a transparent nobody that doesn't even rate a description.

Medical professionals do make house calls, but their ministrations seem limited to administering "calming potions." On the other hand, an "Oculist" pulls off a miraculous cure on Rad by unspecified means. Rad's eyes were burned in a chemical explosion.

Speaking of Rad, he would own *Swift Construction* lock, stock and barrel after being near-blinded while mixing chemicals at Tom's direction without due care by his employer. No safety equipment of any kind was used and "tottering" Rad should never have been tasked with this hazardous job, unsupervised. "There was a "jar, a rush of air and the dull boom of an explosion," followed by Rad crying out in pain. Tom's inane comment is "I hope nothing *serious* has happened..."

Engineering and Science, Fact vs. Fantasy

The concept of flying over a burning building in a slow-flying wood and fabric kite, painted with flammable lacquer, that is almost certainly leaking oil (and maybe gasoline,) frankly scares the daylights out of me. That aside, the idea of bombing a fire from above is well documented and is commonly used, today, if not for burning skyscrapers.

The practical details of aerial fire-fighting are available with the most cursory Google search.

How the "bombs" are constructed and the fire-suppression chemicals used in the story aren't real, though. No amount of Carbon Dioxide dumped into a large blaze from above would have the slightest effect. The tornadic updraft created by the heat of a large blaze would dilute and dissipate the gas. The quantity of suppressant required to fight a large fire is in the range of 40 to 60 *tons* of material. Well beyond the lift capacity of any 20's style aircraft.



302nd Military Air Wing Hercules Dumping MAFF Suppression Chemicals

Geography: Shop-town (Shopton) is once again said to be named after the Swifts' factories. *Swift Construction* has continually grown, and is now surrounded by a high stockade fence. It is said that the proximity to the plant has made the Swifts' Victorian-style home "unpleasant in summer." A cottage, further out in the country, is said to be used as homestead during the warm months. The "residential

section" of Shopton is said to be near a river. This was mentioned in the previous volume as "on the head of a bay" with apparent access to the Atlantic Ocean. *Lake Carlopa* is not mentioned by name, in this tale. Newmarket is said to be the nearest large city with "New York-style skyscrapers." I'd think Albany (mentioned in the 1st episode) would fit this bill, better. Shopton had previously been placed more-or-less on *Lake George (Carlopa)*, in upstate New York "near the Canadian border." (See *Giant Searchlight*, Vol. #15.) The city of Denton is said to be 400 miles distant in a unspecified direction. Perhaps consistency in geographical location and detail wasn't important to the host of ghost-writers that churned out these tales. Lack of coordination has reared its' ugly head, before...I like my stories at least nominally uniform, as it makes them flow better.

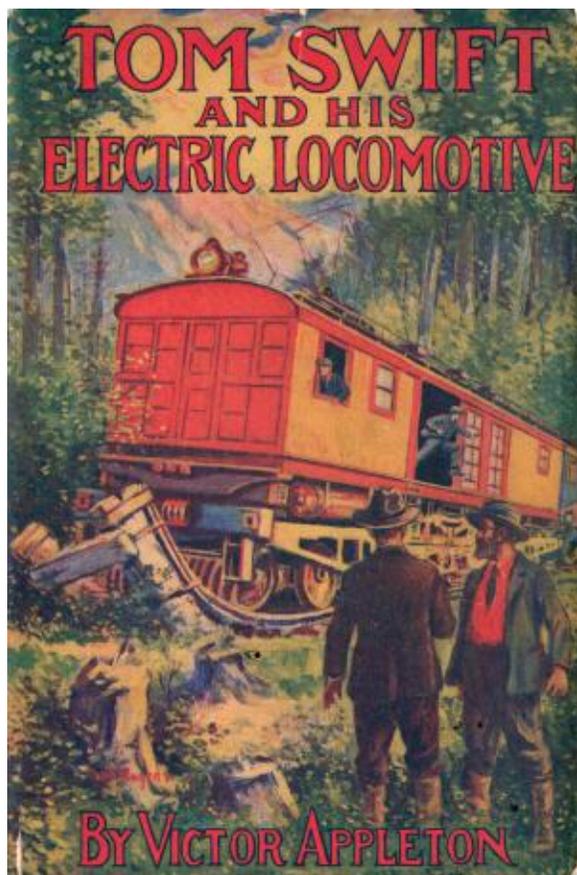
JP Karenko 9/11/05

#25. Tom Swift and His Electric Locomotive (1922)

or, Two Miles a Minute on the Rails

Review by JP Karenko, September 2005

Duotone image courtesy of Mark Snyder; full color image courtesy of James Keeline



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

Nothing gets the old Swift Inventive Juices flowing like a good challenge. Tom is enjoined to design and build an electric railroad locomotive from scratch that will top 120mph and drag a string of loaded freight cars up a 2% mountain grade without slowing to a crawl. Richard Bartholomew is a hard-drivin' rail tycoon, beset by rivals that are trying to put his Western road under by devious and illegal means.

When Tom takes the contract, he joins Mr. B on the bullseye, waiting for the next threat to emerge. High explosives, armed robbery, sabotage, and subterfuge ensue. Then, there are the hazards of trying to control a half a million pounds of runaway loco on a mountain grade. You'll have to read the story to find out the details.

Cast of Characters (More or less in order of appearance)

Barton Swift--Widower. Wealthy and conservative. Inventor master machinist and holder of numerous patents. In this episode, he is described as "semi invalid," Mr. Swift, has failed in his health of late, but "still enjoys fine cigars."

Richard Bartholomew--Short, with olive complexion. President *Hendrickton & Pas Alos* RR. Tycoon & speculator.

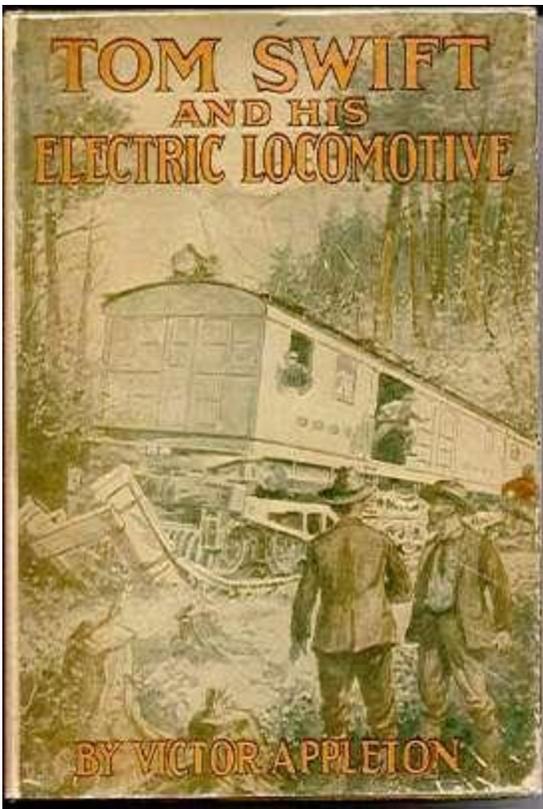
Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. Is a decent cook, too.

Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro journeyman jack-of-all-trades. "Eradicates dirt." Eradicate has now "become too old to do much," but remains faithful to Tom and helps out where he can. Constant rival and antagonist of giant Koku.

Nocturnal Highwayman--Burly footpad who attacks Tom with a club & robs him. Later determined to be Andy O'Malley.

Miss Mary Nestor--Betrothed love interest who lives on the east side of Shopton. Described as a "very pretty young woman with flashing brown eyes, and a sweet trilling laugh." Blushes easily, especially around Tom.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. Apparently quite wealthy. In this episode, he has chicken troubles.



Ned Newton--Chum & companion of Tom. No description given. He has resumed his position as Swifts' financial advisor and CFO of *Swift Construction Company*.

Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited cognitive facilities. Described as "savage and only half-tame," he is antagonist and rival of Eradicate. In this episode, he chases Rad with a 10-foot spear, and must be cautioned not "to kill Tom's enemies" without express permission from his master.

Mr Stanley--NFN or description. Shopton bank VP.

The Bombers

Joe Myrick--Small, neat dresser. Wears a VanDyke beard.

Andy O'Malley--Burly westerner, rough dresser, wears size 12 boots. Is said to be cruel, desperate and a "notorious gunman," leading one to believe he typically goes armed.

McAvoy--NFN or description. *Swift Construction* foreman.

Mr. Toasty--Later determined to be Joe Myrick. Gets hung up in *Swift Construction's* electric fence.

Nugent--NFN or description. *Swift Construction* watchman. Ex-Blatz employee.

Mr. Blatz--NFN or description, except "hungry eyes." Owner, *Blatz Detective Agency*.

Express Train Conductor--No name or description.

George the Porter--No name or description, except Negro.

Montague Lewis--Solid build, grey hair, black moustache. Smokes long black cigars. President *Hendrickton & Western RR*.

Halfway Telegraph Operator--No name or description. Warns H&PA yards of Tom's runaway loco.

Major Inventions:

The *Hercules 0001* is a 285ton, electric drive locomotive, in the 4-12-4 configuration. (See Engineering Fact vs. Fiction) The 12 main driving wheels are 70in. diameter, and powered by 6 dual-motor DC power plants, totaling 4400hp. Power is supplied by a twin pantograph overhead pickups, fed by 3000VDC. The locomotive is 90ft OAL, 10ft wide, and 14ft tall. The planned top speed is 120mph on level track, and the loco is intended to maintain a lesser, but still impressive speed on a 2% grade, which is quite steep, but not unusual for mountain routes.

These specifications are a typical 50-100% improvement over then-current technology, as represented by the Baldwin-Westinghouse and Jandel (See Errata) locomotives of the day.

A minor device that gets some notice is a small self-defense squirt-gun loaded with liquid Ammonia solution. Tom sprays this into an attacker's eyes to foil a robbery attempt. "Bless my pepper spray!" as Mr. Damon would say. He has one, too.

Commentary on Society, Attitudes, Environment & Errata

It's amazing how much technology and society have changed. Reading the old Tom Swift Sr. series has really given me an appreciation of some of the modern gadgets that I've come to take for granted. Some of the real-world electric locomotives similar to Tom's design were actually in service until as little as 30 years ago. Society's attitudes (or at least the authors') have changed, greatly, too. I wonder what people will be taking for granted 100 years from now, and what they will think of our "modern" society and its' mores (or lack of them...)

Attitudes and Prejudices: Language usage was "quaint," with several "Swifties" showing up in the text. This author is an old hand, and I'm identifying him as "Ejaculatin' Jones," since he repeatedly uses the term (8 times) in the text. This is the same writer who did *Land of Wonders* and *Undersea Search*, the other stories where the term is used repeatedly.

Koku and Rad's goodwill efforts from the previous volume have come to naught in this tale, as Koku chases Rad through the Swift household with a 10ft long spear. Rad would have a good case for charging Koku with felonious assault and attempted murder since he ends up taking a dive through Tom's 2nd floor

bathroom window and ends up on the roof of the porch to escape the "half-tame" giant. Koku makes repeated threats to kill Tom's enemies, and much ado is made of Tom forbidding him to kill anyone without express permission. "Tottering" Rad seems no worse for wear, in spite of repeated comments about his frail and elderly condition.

Tom & Mr. Damon are (in my opinion) foolhardy in the extreme. They are willing to take on large, burly attackers described as "armed and desperate" with innocuous ammonia-filled squirt guns. These predecessors to today's pepper spray/mace while effective in the story, have limited usefulness against a determined attacker. Any cop who has had to use one will tell you that results vary drastically from individual to individual. I'd much rather be carrying a Colt 1911 pistol, rather than risk pissing off a professional thug. Fact is, Tom gets "done unto" violently quite a bit in these stories, and I wonder he doesn't learn from experience. Maybe playing the victim makes him more All-American? The saying "It is the inventions of peace, rather than war that stand for human progress." Perhaps the publisher has directed the authors (and I'll lump them all together, here) to preach pacifism, as a reaction/backlash to the Great War.

Mr. Damon is having trouble with chicken thieves. It looks like a crime wave is hitting Shopton. He goes so far as to put an electric fence around the coop to protect his "Buff Orpington" hens. These 7 to 10lb birds are said to be prolific egg layers and make affectionate pets. I wonder if they taste--like chicken?



Buff Orpington



Buff Forkington

Errata: In this tome, it is said Tom goes to Mr. D's home in Waterfield. The current tally of Damon's many moves stands at 12-Waterfield, 6-not recorded or confused, and 10-Waterford, for 25 volumes, to

date. The numbers don't total, because two volumes have him residing in both places at the same time. Six others either do not specify a town name, or have multiple references that change.

Engineering and Science, Fact vs. Fantasy

The Swift Hercules design-The monster loco Tom designs is indeed the "marvel of the age." It is (as usual) 50% faster, more powerful, bigger and heavier than the competition. (See below.) There are a few issues, however that the author missed. *Hercules* was described as having a leading 4 wheel truck (guide) and a 4 wheel trailer, with 12 drivers in between. This configuration could be called a 4-12-4. The numbers used describe the arrangement of the guiding (un-powered) and driving (powered) wheels. In reality, this 90 ft monster would have to be articulated in the center since a 90 ft long solid frame locomotive would need outrageous track radiuses to keep from jumping the rails in turns. That means the configuration would more properly be called a 4-6-0 0-6-4. The "oughts" in the center represent phantom wheel-sets that would exist if the two driving units were in separate structures (i.e. two small engines coupled together instead of one big standalone.) Another issue has to do with speed vs. power. To go fast, you gear a drive one way. To haul heavy loads, you gear a completely different way. Since shiftable drive transmissions for locos did not exist and you get *either* speed *or* power. Tom must have been using *the Force* to rocket this thing to 120 mph *and* haul a drag up the side of a mountain. One final issue, pumping DC electricity into long transmission lines creates fantastic energy waste and danger. To run at slow speed, you throw away most of the electrical energy as heat. Later trains all ran on AC current and used transformers plus rectifiers to convert what they used on-board. See also, *The Real Hercules*, below.

I can find no reference to *Jandel Electric Locomotives* in a Google search, except in regards to this story.

The Competition-Electric Locomotives:

From the early years of the 20th century Baldwin had a relationship with the Westinghouse Electric Company to build electric locomotives for American and foreign markets. The electric locomotive was increasingly popular and electrification was expensive, but for high traffic levels or *mountainous terrain* it could pay for itself. Baldwin built or subcontracted out the bodywork and running gear, and Westinghouse built the electrical gear.

Baldwin built the famed EP-1 (1906), EF-1 (1912) and EP-2 (1923) box cab electric locomotives for the *New York, New Haven and Hartford Railroad*. Baldwin also delivered the EP-3 box cab electric locomotives to the *Milwaukee Road* for use on their line between Harlowton, Montana and Avery, Idaho. (See RR Reality)

A Big Electric Train-The 1923 EP-2



New York, New Haven & Hartford electric locomotive, engine number 0307.

{EP-2, built 1923 by Baldwin-Westinghouse, primarily used in passenger service with occasional use in freight service, retired in 1957}

Engine type BLW 1C1+1C1 From the Otto C. Perry Collection
Photographed: New Haven, Conn., August 18, 1937

Bigger Still-The 1919 Baldwin EP-3

CMS&P 10300 at Three Forks, MT, 9 Aug 1938, by Otto C. Perry Western History Dept, Denver Public Library



10301, Class EP-3, was built by Baldwin-Westinghouse in June 1919, #51844.

This looks to be representative of what Tom was trying to build.

FYI EP=Electric Passenger. EF=Electric Freight.

Really, Really Big-The 1916 Alco-GE EF-1



10208A, Class EF-1, was built in January 1916, by Alco and General Electric.

Note 4-8-0 0-8-4 Configuration. Four-up on Tom's 4-6-0 0-6-4.

This is representative of what Tom was trying to beat.

Things to come-The Real *Hercules*...The Baldwin GG-1

Baldwin built several electric locomotive types for the Pennsylvania Railroad as well including the P5A, R1 and the famed GG1. Baldwin built the first GG1 prototype electric locomotive for use on the Pennsylvania Railroad's electrified line that was completed in 1935 between New York and Washington, DC. A total of 139 units were constructed. They remained in service with the PRR's successors until the early 1980s. The GG1 became one of the most recognized and famous classes of locomotive worldwide.

Technical information: The GG1s were large locomotives, 79ft 6in (24.2m) long and weighing 477,000 lb (216,000 kg). The main body was a single unit formed as a bridge-truss framework and clad in welded steel plate. The driving cabs were set up high about a third of the way along the locomotive from each end for greater crew safety in an accident. A narrower section of nose in front of the cab windows enabled view forward, although the nose remained full height to carry the current-collection pantographs. The bodywork as a whole was smoothly rounded.

This was mounted upon two great cast steel locomotive frames linked by a hinge at the locomotive's middle which allowed side-to-side movement. Six driving wheels (three axles) were fitted towards the center of the locomotive on each truck (twelve in total) and a four-wheeled, un-powered guiding truck was mounted toward each end. In the Whyte notation for steam locomotives, each frame comprised a 4-6-0 locomotive; in the PRR's classification system, 4-6-0s were class "G". The GG-1 consisted of two such locomotive frames mounted back to back, so it was classified GG-4-6-0+0-6-4. This arrangement is called 2-C+C-2 in AAR wheel arrangement notation.

Each driven axle was powered by two 385hp (288 kW) GEA-627-A1 traction motors mounted above and to either side of the axle. Drive was through a reduction gear and a quill drive assembly.

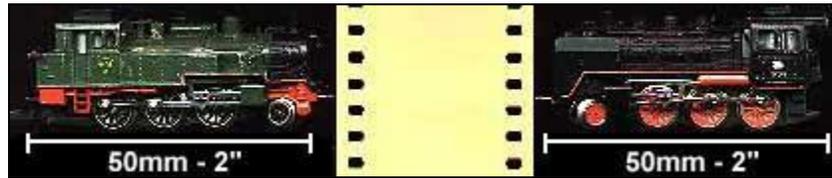
The GG1 was designed to run on the standard Pennsylvania Railroad catenary power of 11,000V AC, 25 Hz. This high voltage was stepped down by a large transformer mounted in the center of the locomotive body for the traction motors, cooling blowers and all other onboard equipment. The locomotive's power was controlled via a tap-switching arrangement; the number of secondary windings in use could be varied, thus adjusting the output voltage (and speed.)

The units were rated at 4,620 hp (385 per motor) continuous rating and a maximum of 9,500 hp at 49 mph (intermittent duty). For passenger service, the GG1 was geared to run at 100 mph maximum although it achieved 110 mph in testing. For freight service, the locomotive was geared to run at 90 mph maximum speed.



Baldwin GG-1

These specs matched Tom's design criteria *almost exactly*, except for top speed and voltage type & supply. Reality, however, took another 13 years (1935) to catch up to the Our Hero's innovative thinking.



The Other Extreme-These locos are built to Z Scale. The image is full sized.

Driver wheels measure 0.25inch diameter. From the website of:

ANIMATO J-E Nyström, Ulvilantie 2 A 7, 00350 Helsinki, Finland

Geography: *Swift Construction* has continually grown, and is now surrounded by a high stockade fence that is topped with electrified barbed wire. This fenced-in property is sufficiently large that a 2-mile long circular railroad test track can fit inside it. There goes the neighborhood...

Koku now lives in an apartment over the Swifts' garage, and note is made that a special bed had to be constructed because of his large, but unspecified height and weight.

Rad is now living in a room or rooms near the attic in the Swift manse. Previously he had been housed in a space over his mule Boomerang's stable. Boomerang has passed on.

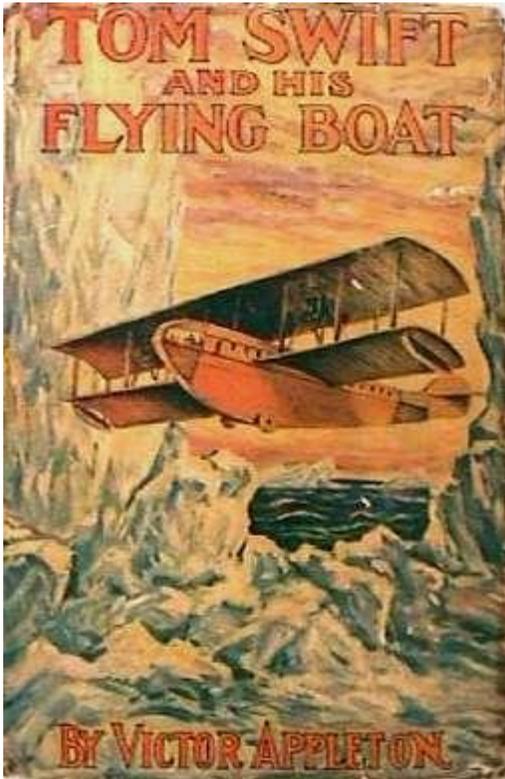
The Chicago, Milwaukee, and St. Paul RR. Could have been the model for the fictional H&PA RR. A major expansion of that railroad occurred in the 1900s. Between 1906 and 1909, new railroad lines were built from South Dakota to Puget Sound and the Seattle/Tacoma region of Washington. The railroad also pioneered long-distance electrification, completing over 400 miles of track, beginning in central Montana by 1916. In electrifying the track, company managers hoped the savings from using hydroelectric power would offset the cost of the electrification, and provide lower costs hauling trains over the 2.2% grades of the line. While the electrification was an engineering marvel of the day, in the end they did not contribute to the success of the company and are believed to have led to the company's bankruptcy in 1925.

JP Karenko 9/13/05

#26. Tom Swift and His Flying Boat (1923)

or, The Castaways of the Giant Iceberg

Review by JP Karenko, September 2005



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

Tom has decided that seaplane technology is in need of the Swift Touch. What is currently "out there" is not big, fast or advanced enough to suit Our Hero. A new, large and typically luxurious flying boat is designed from scratch and is built in record time. Just in time, as it turns out, to mount a rescue mission to the Arctic in an attempt to save Wakefield Damon and Tom's future father-in-law, Amos Nestor. These unfortunates have been stranded on an ice berg after the schooner they were traveling on was wrecked.

In addition to the usual hazards of wind and weather, it seems agents of the newly formed Soviet Peoples' Republic are out to boat-nap Tom's creation.

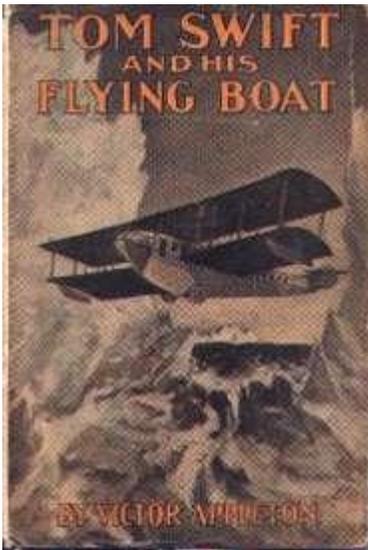
How these problems are resolved, you will have to locate a hard cover copy of the book to find out.

Cast of Characters (More or less in order of appearance)

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. Is a decent cook, too.

Barton Swift--Widower. Wealthy and conservative. Inventor master machinist and holder of numerous patents. In this episode, he is described as "old," Mr. Swift, has enjoyed improved health of late.

Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro manservant. "Eradicates dirt." Eradicate has now "become too old to do much," He is described as "grey and asthmatic." He remains faithful to Tom and helps out where he can. Constant rival and antagonist of giant Koku.



Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited cognitive facilities. Described as "savage and only half-tame," he is antagonist and rival of Eradicate. In this episode, his eyes are described as "yellow, and slitted like a cat's." Much is made of his great strength, nocturnal eyesight and acute hearing.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. Never fully described, except as "portly" in an early episode, here we find out he has a moustache and wears "tortoise-shell glasses." Appears to be quite wealthy, but in this episode, he observes that the "gasoline people are robbing him." See Attitudes.

Mr. Aman Dele--No description given. Visitor to NYC from Iceland. Adrift and helpless, unable to make himself understood, as he has no language skills other than his native tongue. Befriended by Wakefield Damon, above.

(Rev.) Erick Brodak--No description given, other than "old." Missionary pastor of a Reykjavik parish church. Executor of Aman Dele's Estate.

Miss Mary Nestor--Betrothed love interest who lives on the east side of Shopton. Described as a "very pretty young woman with flashing brown eyes, and a sweet trilling laugh." Blushes easily, especially around Tom. Also described as "plucky."

Dr. Goslap--NFN or description. Shopton GP who treats Amos Nestor.

Norwalk Chauffeur--No name or description given. Employed (for the moment) by *Pelton Brothers Garage*. Inebriated and dangerous, he causes an automobile wreck.

The Prima Donna--Passenger in the wrecked auto (above.) Foreigner, bushy hair, large spectacles and a supercilious attitude. (Think Ivana Trump but with an *attitude*...) Later determined to be one **Dr. Simon Raddicker**, a famous diagnostician from NYC. Needs a serious dose of good manners and probably, an extra-strong laxative.

Clerk, Shopton House Hotel--No name or description given. Walk-on part.

Harry M'Connell--Shopton Slaughterhouse Chandler. Purveyor of Prize Porcine Parts.

Mr. (Amos) Nestor--Mary's father. In spite of major roles in several of these adventures, his description is never given, and his first name was only mentioned in passing, in episodes #1 and #6. In this tome, he is suffering from a potentially fatal, but unspecified malady and must travel to the far North to heal in the cold dry climate.

Mrs. (Amos) Nestor--Mary's mother. In spite of major roles in several of these adventures, her description is never given, and her first name is never mentioned. The only thing known about her is that she is a good cook and wife, caring deeply for her husband, and is more or less helpless without a man around to take care of her.

Mrs. Wakefield Damon--In spite of significant roles in several of these adventures, her description is never given, and her first name is never mentioned. The only thing known about her is that Mr. D thinks she objects to his travels and adventures with Tom & Co. It is said she has "given up" objecting and lets her husband do as he pleases. She spends a lot of time at her mothers' house. Said lady must be very aged, as Damon is described as "elderly," himself.

Damon's Manservant--No name or description given. Walk-on part.

Ned Newton--Chum & companion of Tom. No description given. He has resumed his position as Swifts' financial advisor and CFO (Treasurer) of *Swift Construction Company*. Voice of caution regarding Tom's expenditures, sometimes obnoxiously so. In the last two tales, he is uncharacteristically doom-and-gloom and sarcastic. Needs a girl friend, or something...

Carney--No name or description given. Faceless, but trusted Swift employee. Experienced older mechanic. Walk-on part.

The Familiar Stranger--Wears a frock coat, top hat and wears a Gardenia in his buttonhole. Facial hair includes a "Charlie Chaplain" moustache and goatee. Speaks with a French accent. Is said to be named **Polansky** and to be working for the newly-formed Soviet Government. We never do find out why he seems "familiar," as this is his first appearance in the series.

Brannigan--No first name or description given. Faceless, but trusted Swift employee. Chief of aircraft crew & "mechanician."

Kingston--No first name or description given. Faceless, but trusted Swift employee. Radio/wireless operator. Walk-on part, with lines.

Danish Military Officer--No name or description given. Faceless leader of a gaggle of Icelandic Militia.

Soviet Bureaucrat--No name or description given. Faceless, blustering and bumbling bureaucrat. Walk-on part.

Captain Olaf Karofsen--Master of sunken *MY Kalrye*. Tall, burly, shaggy sea captain. A simple soul and nearly as large as Koku.

Karofsen's Kool Krew--Three faceless and nameless sailors, stranded with Mr. D & Mr. Nestor on the berg.

Uncle Frosty and Cousin Chilly--Brother and Nephew of Karofsen, both thought to be killed in a tumble down a crevasse. No descriptions or names. Walk-on parts.

Admiral Gilder--Navy Board Chairman. Passing mention.

Major Inventions:

The *Winged Arrow* is a twin-engine seaplane of 110ft span and 60ft long hull. It is powered by two 400hp "Liberty" motors, has a top speed of about 100mph and a 2000 mile range. It sports a glass nose control/observation area, forward, with radio "coop" just behind the pilots' seats. It has berths for eight passengers, a cabin (presumably for Tom) and galley. The several crew are housed in hammocks, aft. Whatever heater(s) are on board are inadequate, as it is said that drinking water freezes at altitude and all must wear heavy coats to remain warm.

Engineering features include twin Searchlights (presumably Tom's ultra-bright *Great* variety,) and detachable wing outriggers that can double as motor-dinghies. The hull is double walled, and is initially said to be built that way for floatation safety in rough water, which is logical and innovative for the time. Later, it is said to be evacuated, (vacuum) which would exacerbate any water leaks. Still later, pumping compressed air into these spaces is said to "stabilize" the aircraft when it rolls uncontrollably during the test flight. This wonderful, if impractical technique is called an "equilibrator." See Errata.

The other feature that makes this craft unique is the (usual) ability to lift stupendous loads without logical or visible means. The performance and endurance of the craft are also significantly better than the state of the art, but with 50% less horsepower used. See Specifications.

Commentary on Society, Attitudes, Environment & Errata

It's amazing how much technology and society have changed. Reading the old Tom Swift Sr. series has really given me an appreciation of some of the modern gadgets that I've come to take for granted. Society's attitudes (or at least the authors') have changed, greatly, too. I wonder what people will be taking for granted 100 years from now, and what they will think of our "modern" society and its' mores (or lack of them...)

Attitudes and Prejudices: Language usage was quite modern, with numerous colloquial aphorisms being used, and quite a few slang terms, too. There was one reference to piazza, three cases of spontaneous ejaculation, and a couple of "swifities." The author was familiar with small details of *Electric Locomotive*-or at least he had read it recently. This leads me to conclude that "Ejaculatin'Jones" is the ghost writer of choice in this episode. This seems to be the same writer who did *Land of Wonders*, *Undersea Search*, and *Electric Locomotive*, the other stories where the E-term is used repeatedly.

Missionaries and things spiritual also show up repeatedly in the tome. Rad is said to object to Koku's "voodoo" chants while they are fishing, and calls him a "heathen." All work at *Swift Construction* shuts down on the Sabbath. It's 24/6-3 shifts the rest of the week. These religious attitudes could be a tie-in to the author of *Electric Rifle*, *Great Searchlight* and *Wizard Camera*. Coincidentally, *Wizard* is another tale where Mary's dad played a major role. I'm going to have to start a matrix. If Harold Garis actually wrote all of these tales, (which is considered to be a given in some circles) he has multiple personalities and writing styles to go with them. Methinks not. Too many things change from tale to tale. Not just details.



Women are still pretty much relegated to the role of helpless ornamentals, with the possible exception of Mary Nestor. She is atypically "plucky" and able to withstand the social pressure of doing things like flying, going un-chaperoned after dark and driving an automobile. On the other hand, she is apparently at a loss in the kitchen, which means she is limited to hooking up with someone wealthy enough to afford servants...like Tom. I envision a young Amelia Earhart.

Rad, Koku and even Ned Newton are referred to in denigrating terms (Rad's description(s) would be termed racist or "hate speech," nowadays.) All are called "boy." I suspect calling a 9ft 400lb club-wielding giant "boy" to his face would be a wonderfully expensive and painful way, at least nowadays, to learn proper race-relations.

Interestingly, Mr. Damon complains about how the "gasoline people are robbing him." This was in the days when petroleum products sold for pennies a gallon. Some things don't change, much. (Fuel in Michigan peaked at \$3.69 a gallon in 2005 and was 50% higher still in areas where opportunists were even less inhibited. Now, *that's* robbery...)

There is significant emphasis and importance placed on patents, courts, compensation, stocks, speculation and bankruptcy in this tale. Police are now apparently effective, and "thrashing" your enemies no longer seems to be *de rigueur*.

Tom "arms" his crew with empty rifles during a confrontation. Probably a wise move from a diplomatic standpoint-after all, who wants to start a war over an accidental discharge? It also resembles some of the tactical wisdom of Sun Tzu in *The Art of War*, to wit: "Hence to fight and conquer in all your battles is not supreme excellence; supreme excellence consists in *breaking the enemy's resistance without fighting.*" I wonder about the effectiveness of waving an empty gun around, though, when the other guys have rifles, too. If you threaten and posture and the other guy just doesn't "get it," it may be necessary to return fire. An empty rifle then becomes merely an expensive and not very effective club.

Don't bring a club to a gun fight is *my* tactical wisdom-but then, I'm from Detroit....

Shopton hotel rooms do not come with individual bathrooms.

Errata: In this tome, Mr. D's home remains in Waterfield. The current tally of Damon's many moves stands at 13-Waterfield, 6-not recorded or confused, and 10-Waterford, for 26 volumes, to date. The numbers don't total, because two volumes have him residing in both places at the same time. Six others either do not specify a town name, or have multiple references that change.

Red Cloud, Tom's original combo dirigible/aeroplane, was destroyed in episode #8 Caves of Ice. The author refers to it as if it still resides in a shed, somewhere on the Swift property.

Typos and malaprops were very limited. P35 has Tom being skil(l)ful, p51 has Rad stringing fish on a withe (wire) and p67 has Tom's dad named Barton Hopkins. **[Correction: 'withe' is a real word, meaning 'band or rope made of twisted twigs or stems.']** It's possible that this may be his middle name, as it has never previously been mentioned, but the sentence structure pretty-much precludes that.

After a polar bear is killed, it is suggested they salvage the meat. Polar bear meat is considered delicious, but it is never eaten raw like other meats because it carries many parasites, like trichina. The polar bear liver is never eaten or fed to animals because it causes Vitamin A poisoning, which results in severe illness or even death.

Engineering and Science, Fact vs. Fantasy: Short of liquefying it and using the liquid for ballast, I don't see how any amount of compressed air pumped into an aircraft fuselage, is going to stabilize it, once airborne. Tom's "equilibrator" is somebody's pipe-dream. Roll stability in an aircraft is governed by three things: How much dihedral is built into a wing, the airfoil shape and how high the wing is mounted on the fuselage.

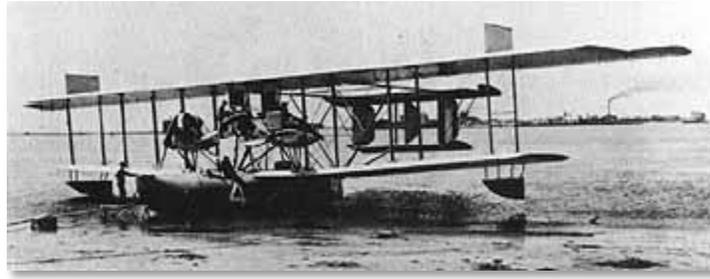
The current seaplane technology of the 1920's was represented by the Curtiss NC-4 flying boat. It had remarkably similar specs, to the *Winged Arrow* but 4 Liberty power plants, to Tom's two.

Flying Boat Specifications

	NC-4	Swift Winged Arrow
General Characteristics		
Crew:	Six	Eight, plus 8 passengers
Length:	68 ft 3 in (20.8 m)	60 ft
Wingspan:	126 ft (38.40 m)	110 ft
Height:	24 ft 4 in (7.40 m)	Not specified
Wing area:	2,380 ft (221 m)	Not specified
Empty:	16,000 lb (7,257 kg)	Not specified
Loaded:	27,386 lb (12,448 kg)	Not specified (but LOTS!)
Powerplant:	4x Liberty engines, 400 hp (298 kW) ea.	2x Liberty Engines
Performance		
Maximum speed:	95 mph (152 km/h)	100 mph
Range:	1,470 miles (2,352 km)	2000 miles
Wing loading:	11.5 lb/ft (56.3 kg/m)	Not specified
Power/Mass:	0.06 hp/lb (0.01 kW/kg)	Not specified

Tom smashes the wing-tips of the *Winged Arrow*, not once, but twice into the wall of a glacier. Both times, the pontoons are damaged, but his mechanics manage to fix the damage with little problem. The idea of smashing hard enough to do that much damage without ground-looping into a wall of ice & rock bodes well for Tom's flying skills.

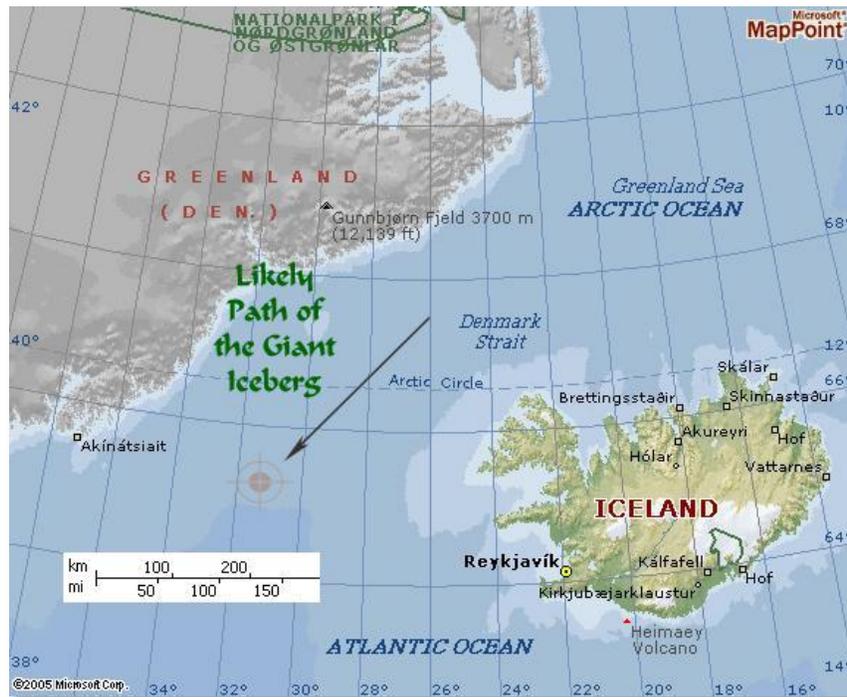
(Note where the pontoons ride on the NC-4, below.)



Curtiss NC-4 Flying Boat ca 1920

Tom takes off from a deep valley or canyon on the iceberg with a short run and has to climb out with limited space around him. (He has "pranged" the wingtips several times already.) He does this with a full overload of passengers, and no flaps. Why could some of them have not hiked out to the plain where the castaways had their camp, and then been picked up? They hiked in without difficulty. This would have reduced the risk to the aircraft and passengers.

Geography: Lake Carlopa is back. Rad and Koku go fishing there for White Perch. Winged Arrow is said to "cross 3 states" on the way to Cape Cod. That would be Vermont, New Hampshire and Massachusetts. Looks like Shopton is back up near Lake George, again.



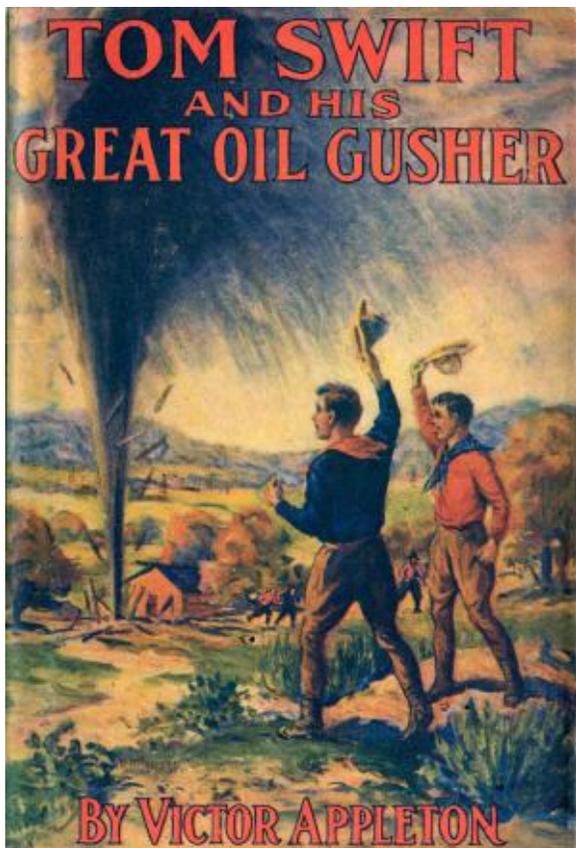
Denmark Strait Image Courtesy Microsoft MapPoint

JP Karenko 9/18/05

#27. Tom Swift and His Great Oil Gusher (1924)

or, The Treasure of Goby Farm

Review by JP Karenko, September 2005



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

Spring has sprung. It's been 6 months since the adventures in Greenland, and the time has now come to get down to the business of making money. *Swift Construction* has undertaken a contract, at the behest of Mr. Damon, to make oil well drilling equipment for a group of Texas wildcatters. In short order, it is found that these fellows are "shady characters." They have to be watched constantly by Ned Newton, the Swift CFO, to keep them from pulling various financial shenanigans. There's also a matter of a "cad" snuffing around Tom's sweetie, Mary Nestor. That he is one of the Terrible Texas Trio, is added fuel to the fire.

While money matters occupy Ned, Tom comes up with a new style rotary well drilling rig that cuts through rock 3 times faster than the existing machinery can. They go to Texas to try the new device, and find out that "roughnecks" didn't get that nickname by being "nice." The dangers of tenderfeet drilling a well are the least of their worries once the crude starts flying.

How these problems are resolved, you will have to locate a hard cover copy of the book to find out.

Cast of Characters (More or less in order of appearance)

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. In this tome (1924) is described as 6ft tall and "about 21 years old."

Ned Newton--Chum & companion of Tom. No description given. He has resumed his position as Swifts' financial advisor and CFO (Treasurer) of *Swift Construction Company*. Voice of caution regarding Tom's expenditures, sometimes obnoxiously so. In the last several tales, he is doom-and-gloom and sarcastic. Needs a girl friend, or something...See Carol Goby, below.

Garrett Jackson--No description given, but is spry and fit for his age. (Original volumes described him as "aged.")

"Hillobie"--Later determined to be one **Hitt Goby**--Aeronaut, severely injured in a wreck testing a new airplane. Rescued from a fiery death by Tom & Ned.

Dr. Sherwood--NFN or description. Attending physician, Shopton Hospital.

Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited cognitive facilities. Described as "savage and only half-tame," he is antagonist and rival of Eradicate. In this episode, his great strength is highlighted and put to great use.

Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro manservant. "Eradicates dirt." Eradicate has now "become too old to do much," He is described as "grey, old and hobbling." He remains faithful to Tom and helps out where he can. Constant rival and antagonist of giant Koku.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. Never fully described, except as "portly" with a moustache and "tortoise-shell glasses." Appears to be quite wealthy. In this episode, he brings *Swift Construction* a dubious business proposition with a group of shady characters. See below.

The Terrible Texas Trio:

Thompson--NFN or description, except "sharp dresser. Swindler/bad guy/oil wildcatter.

Bragden--NFN or description, except "sharp dresser. Swindler/bad guy/oil wildcatter.

Hankenshaw--Fat, gross, uncouth, rough dresser, cad, and drunkard. Those are his *good* points. Also smokes a "foul" pipe. Has the audacity to annoy and actually *touch* Mary Nestor's arm.

Barton Swift--Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. In this episode, he is described as an invalid and having trouble with his teeth. Mr. Swift, has enjoyed improved health of late. We also find he wears glasses.

Miss Mary Nestor--Tom's betrothed love interest who lives on the east side of Shopton. Described as a "very pretty young woman with flashing brown eyes, and a sweet trilling laugh." Blushes easily, especially around Tom. Also described as "plucky."

Mr. (Amos) Nestor--Mary's father. In spite of major roles in several of these adventures, his description is never given, and his first name was only mentioned in passing, in episodes #1 and #6. In this tome, he is recovering from a potentially fatal, but unspecified malady that was arrested in the far North. The cold dry climate effected a near cure.

Mrs. (Amos) Nestor--Mary's mother. In spite of major roles in several of these adventures, her description is never given, and her first name is never mentioned. The only thing known about her is that she is a good cook and wife, caring deeply for her husband, and is more or less helpless without a man around to take care of her.

Wilkins--NFN or description given. Faceless owner of Shopton's only confection shop. Walk-on part.

Ried & Crawford--NFN's or descriptions. Washington attorneys that represent Swift Construction in patent matters.

Texas Telegraph Operator--NFN or description given. Faceless college student working a summer job "pounding the key" for tuition money.

Carol Goby--Beautiful farmer's daughter with chestnut hair, limpid brown eyes and a "perfect" figure. Good cook and practical demeanor. Much taken with Ned Newton.

Farmer "Pa" Goby--50-ish, blind, kindly and intelligent. Wears colored glasses and hails from "up North."

Mammy Jemimah--No real name or description given. Faceless old Negro servant lady on Goby farm.

Judge Wilson--NFN or description given. Faceless, Circuit Court Judge, acts as counsel for Gobys in contractual matters.

Mr. Blythe--NFN or description given. Faceless representative of "a major oil company." Interested in purchasing Tom's handiwork.

Wesson & Robbins--Dallas firefighting firm. Supply Tom with commercial Swift-designed aerial extinguisher bombs, when "Da Gusher" is threatened by a brush fire.

Major Inventions:

The *Humming-bird* aircraft (See Vol #9) is reintroduced. Fly-on part. No bearing on the details of the plot except as a transportation prop.

The *Winged Arrow* flying boat (See Vol #26) is reintroduced. Fly-on part. The main bearing on the details of the plot is its' use as heavy lifter and a firefighting platform late in the story. Interesting aside, Tom's original motor-boat (See Vol #2) was named *Arrow*.

The Swift Aerial Fire Extinguisher Bombs (See Vol#24) are used late in the story.

A new well drilling bit is developed, based on the "rotary method" rather than the old "percussion" style of drilling. This bit allows wells to be cut three times faster than state-of-the-art rigs. No description or details of this wondrous device are given.

A new-style well capping device is also introduced, that allows a "gusher" to be throttled and then sealed-off safely and quickly. No description or details of this wondrous device are given.

Commentary on Society, Attitudes, Environment & Errata

It's amazing how much technology and society have changed. Interestingly enough, this particular old Tom Swift Sr. episode has little to do with actual invention(s) and much more with personalities and social conflict rather than any gadgets. Society's attitudes (or at least the authors') are changing, constantly, too. I wonder what people will be taking for granted 100 years from now, and what they will think of our "modern" society and its' mores (or lack of them...)

Attitudes and Prejudices: There is actually some real business transacted in this tome. I had begun to think Ned Newton was a drone as opposed to a worker bee. I find that in this tale, he actually is *working* for the interests of *Swift Construction*.

Bits of Scripture are quoted in the story, as well as numerous modern as opposed to "folksy" aphorisms (one-liner words of wisdom.) Tom is also extremely "physical" in this tale, getting into hand-to-hand combat three separate times, once while carrying a pistol. That he disarms this mugger is believable, but to give the miscreant his gun back and send him on his way is the height of foolhardy all-Americanism, in my book. At a minimum, disable the firearm, or just keep it and turn it over to police. Maybe all those electric shocks and blows on the head are starting to affect Tom's judgment...

Public drunkenness plays a part in this tale for the second time. Hankenshaw (in addition to his other fine qualities) is a mean drunk, and when he tries to molest Mary Nestor while inebriated, Tom ends up shoving him through the plate glass window. That he is unscathed, is hard to believe, although it is said "God protects fools and drunkards." My (admittedly limited) experience watching a boyhood friend on a bicycle collide with a showcase window required a strong stomach, many stitches and a long recuperation. Tom was also lucky not to lose his shirt in a personal injury lawsuit....

There is a lot of time spent in discussion of personalities and character, rather than the inventions and technical stuff. This leads me to think that this author may be another new fish. Ed Stratemeyer's daughter was gearing up to take over authorship of the series, about now.

Errata: I've decided to change the format of the scorecard I use to keep track of this running gag. I had previously complained that the folks at G&D couldn't keep track of Mr. D's home town, and I found out, lately, that I can't either-and I have a computer! Cut and paste will screw you up every time, if you copy a mistake. I did. There are now 4 distinct categories. In this tome Mr. D's home is not identified.

The tally for 27 volumes, to date is:

Waterfield-13, Both places-2, Waterford-7, and Neither place-5.

Not a single misspelling or malapropism was noted in the text. Uncharacteristically good care was taken at G&D while editing and/or typesetting this tale.

Engineering and Science, Fact vs. Fantasy



Tom's "revolutionary" rotary well drill may have been actually invented in 1894. A rotary drilling rig was used to drill Corsicana's first well in that year. It is now housed in the Smithsonian's Museum of History and Technology.



**Picture Post Card - Greatest Oil Fields in U.S.
Powell Field – Corsicana**

From the collection of Edward L. Williams

The Spindletop Gusher (See below) may have been the real event that this tale of travail was based upon. The authors seem to whipsaw back and forth between "inventing" their own fanciful stories and "filing off the serial numbers" on real events and attributing them to Our Hero. Details of Spindletop well match almost exactly what transpired at "Goby Farm." *Electric Locomotive* was another tale where reality was shamelessly plagiarized and those readers without close contact to current events would think that Tom's "inventions" were original-or perhaps *Baldwin Locomotive Works* stole Tom's ideas???

Spindletop - Birth of the Texas Oil Industry

Though not a California well, the Spindletop gusher, which blew out on January 10, 1901 near Beaumont in East Texas, had a great impact on the California oil industry. Spindletop was not the first nor the biggest gusher - the Adams Canyon, Shamrock and Blue Goose gushers of California were earlier and the Lakeview gusher was bigger. However, Spindletop was certainly one of the great gushers of all time, and, most important, it heralded the birth of the Texas oil industry.

Spindletop blew in when Anthony Lucas, a Louisiana mining engineer, drilled a well to 1,020 feet on a lease owned by Texas businessman and amateur geologist Patillo "Bud" Higgins. Lucas placed his well on a low hill that he and Higgins thought might be a salt dome, and when the ground began to tremble on that fateful day in January and a great spout of oil exploded into the air, it confirmed their belief that oil accumulated around salt domes. The well produced an astounding 800,000 barrels of oil in just 8 days, but quickly dropped off enough so that by January 19 Lucas and his crew were able to cap it and gain control of it. (*Can you imagine 3/4M barrels of oil "thrown away?"* ñJPK)

By September, there were at least six wells producing from the crest of Spindletop, with many more on the way. The field produced over 17 million barrels of oil in 1902, but production declined rapidly, and dropped to 10,000 barrels/day by the start of 1904. However, oil was found on the flanks of the dome in 1925, which led to another surge in drilling that pushed production to an all time high of 27 million barrels in 1927. Total production from the field in 1985 stood at 153 million barrels.

Geography: Thaxton Woods is located about 2 miles from Shopton. Nestors and Newtons reside on the same street, on the east side of Shopton. The Swifts' summer cottage is again mentioned, but not used, in this tale. The high stockade fence around a very large Swift Construction, remains.



*"Largest Producer in Panhandle
11000 Barrel Gusher near Borger, Texas"
1920s*



*"Along Dixon Creek Canyon, Borger Texas Oil Fields"
1920s*



*Boom town Borger showing Theatre, late 1920s
Photos courtesy Ken Sharpe Collection*



Gusher Powell Field Corsicana
From the collection of Edward L. Williams

Borger, TX is 50 miles NE of Amarillo in Hutchinson Co., the "panhandle"

Texas covers more than 260,000 square miles. The oil industry, for all the benefit "black gold" has brought to this country, turned the northern part of it into an industrial wasteland. I cry when I see the ecological devastation in these old photos.

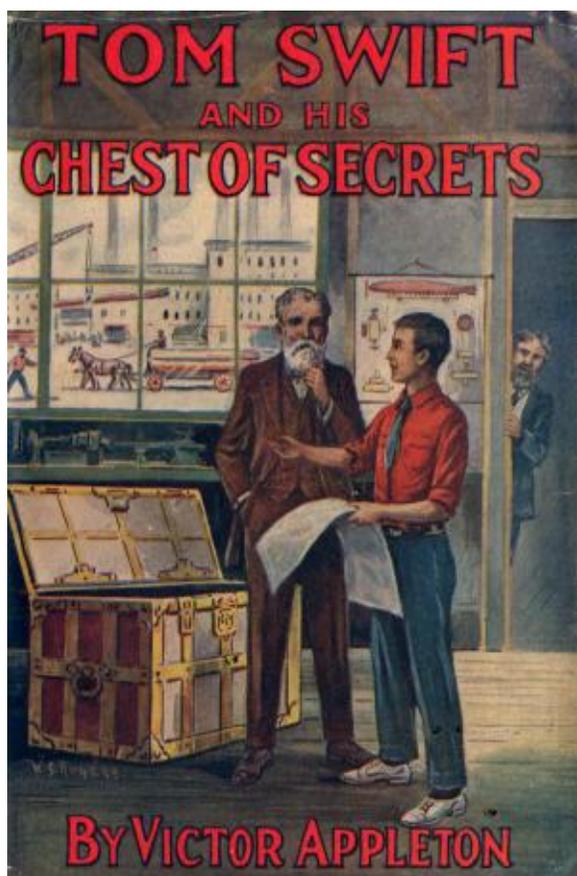
JP Karenko 9/28/05

#28. Tom Swift and His Chest of Secrets (1925)

or, Tracing the Stolen Inventions

Review by [JP Karenko](#), September 2005

Image from the collection of James D. Keeline



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

Mr. Damon is up to his old tricks. The story opens with a bang, or rather a crash, as he lands his new *Butterfly*-style airplane on the roof of Tom's office. Otherwise, this is a straightforward tale of industrial espionage and theft. Tom has enough valuables in the form of blueprints, formulae and models lying around his office, that he is becoming concerned someone might steal them. He has constructed a large, heavy, brass-bound Oak chest to keep his goodies in until a proper underground vault can be built. Koku the giant, is posted as guard. The chest is heavy, but not heavy enough. Tom suffers the usual "cowardly blow" in mid-story, and wakes from the aftereffects to find his possessions, the chest *and* his giant manservant all missing. What a revolting development this is!

How these problems are resolved, you will have to locate a hard cover copy of the book to find out.

Cast of Characters (More or less in order of appearance)

Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited cognitive facilities. Described as "savage and only half-tame," he is antagonist and rival of Eradicate. In this episode, his great strength is highlighted and put to great use.

Ned Newton--Chum & companion of Tom. No description given. He has resumed his position as Swifts' financial advisor and CFO (Treasurer) of Swift *Construction Company*. He is the voice of caution regarding Tom's expenditures, sometimes obnoxiously so. In the last several tales, he is doom-and-gloom and sarcastic.

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. In this tale we find he is fit, tanned and does not smoke cigars.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. Never fully described, except as "portly" with a moustache and "tortoise-shell glasses." Appears to be quite wealthy. Has once again taken up his old hobby of wrecking transportation conveyances.

Garrett Jackson--No description given, but is spry and fit for his age. (Original volumes described him as "aged.") *Swift Construction Shop Manager/General Foreman*.

Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro manservant. "Eradicates dirt." Eradicate has now "become too old to do much," As described, he now has "white hair in a fringe and is bald on top..." He remains faithful to Tom and helps out where he can. Constant rival and antagonist of giant Koku. I envision a skinny Uncle Remus.

Barton Swift--Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. In this episode, he is described simply as old. Mr. Swift, has enjoyed improved health of late, and is now working on a book about inventing. We also find he wears glasses. Not surprising for someone of his advanced years.

Ralph Plum--Attorney retained by *Swift Construction* to handle local legal matters.

Mr. (Noname) Newton--Ned's father. NFN or description. Employed by *National Investments Company* of Shopton, is accused of stealing Liberty Bonds. First major part in these tales, but no name, description or character development is provided by the author.

Renwick Fawn--Well dressed, go-fast managerial type. Walks with a limp and "throws out his left elbow when he walks." Anyone who remembers Walter Brennan in *The Real McCoys* television show will recognize this gait. Bad guy.

Deputy (Noname) Dawg--Generic standby cop. No name or description. Walk-on part.

Amos Beck--No description. President of *National Investments Co.*, where Ned's father works.

Judge Klein--Generic standby court official. NFN or description, except "learned." Walk-on part. Arraigns Ned's father for Grand Theft.

Prosecutor Nixon--Generic standby court official. NFN or description. Walk-on part.

Ivan Barsky--Large bushy-bearded "Russian" pattern-maker and mechanic. Truly fractures his English with a fake Russian accent. Later found to be one (Noname) Blodgett, ringleader of an industrial espionage gang (See Gang of ?, below.)

The Nocturnal Listener--Generic window-peeper. Never identified, and has no actual part in the story. Shopton (or at least the Swift household) seems to have a plague of these critters. I'd consider a large dog or a trench under the outside library windows.

Dirk, the Mechanic--Generic Swift employee. No name or description. Walk-on part.

Miss Mary Nestor--Betrothed love interest of Tom who lives on the east side of Shopton. Described as a "very pretty young woman with flashing brown eyes, and a sweet trilling laugh." Blushes easily, especially around Tom. Also described as "plucky."

Kate Borden--No description given. Shop-till-you-drop cohort of Mary Nestor. Walk-on part.

The Lunch Bunch--Three of the Gang of ? No names or descriptions. Walk-on parts.

Mr. (Amos) Nestor--Mary's father. In spite of major roles in several of these adventures, his description is never given, and his first name was only mentioned in passing, in episodes #1 and #6. Walk-on part in this tale.

Mrs. (Amos) Nestor--Mary's mother. In spite of major roles in several of these adventures, her description is never given, and her first name is never mentioned. The only thing known about her is that she is a good cook and wife, caring deeply for her husband, and is more or less helpless without a man around to take care of her. Walk-on part in this tale.

Mrs. Baggert--Swift's aged housekeeper. In this tale, she rattles around trying to dose Tom's father with catnip tea.

Dr. Clayton--NFN or description. Ministers to Tom's Dad after a blow to the head. Walk-on part. Shopton is apparently full of doctors who never work twice in these tales.

The Red Headed Rogue--Later found to be Ivan Barsky/Blodgett without the wig & false beard. Can't be a Russian--We don't run to red hair.

Gang of ? Merry Masked Marauders--Cohorts of Blodgett and Fawn. Industrial spies and extortionists. Various described as being eight, seven, five and three in number. Generic bad-guys that come and go, as needed to fill out the story.

Mrs. (Noname) Fawn--Small, pale, timid, and unimpressive. Later found to be victim of domestic violence at the hands of husband Renwick.

Farmer "Pa" Kimball--50-ish, kindly and helpful. Gives Tom & Ned important information.

Jason Stern--Ornery, mercenary farmer. Along with his hired help, below, provides aid to Tom & Ned, but in exchange for cash.

Tume--Generic farm hand. No last name or description.

Ben--Generic farm hand. No last name or description.

Jake--Generic farm hand. No last name or description.

Nathan--No last name or description. Owner of *Nathan's Garage* in the burg of Fenwick. (Note: Fenwick was owner of the *Whizzer* in Vol. #6 *Wireless Message*.)

Lonely Cabin Couple--Generic elderly farm folk. "Old Timers" who don't believe in things like aeroplanes, since "They ain't natural!"

Pa (Noname)--No name or description.

Ma Hattie--No last name or description.

Fenwick Chief of Police--No name or description. Generic lawman.

Kollektion of Keystone Kountry Kops--Unknown of they were "real" cops or temps, deputized for an afternoon. *Twenty* of them. Shades of Bonnie & Clyde!!!!

Mr. Blythe--NFN or description given. Faceless representative of "a major oil company," introduces in *Oil Gusher*. Interested in purchasing Tom's handiwork.

Major Inventions:

The *Hummer* aircraft is introduced, and then discarded. Small and speedy 2-seater. Fly-on part. No bearing on the details of the plot except as a transportation prop. Burned up in a forest fire. See **Attitudes**. May be a partial/corrupt memory of *Humming Bird* aircraft.

The *Black Bird* is introduced. Fly-on part. The main bearing on the details of the plot is its' use as heavy lifter and transportation prop. Described as "large," it seats 4, or three, if one of the occupants is Koku.

The *Blue Bird* is the bad guys' getaway plane. *Really* big, as it seats 8 plus carries a multi-hundred pound chest. Can they be *all* bad if they name their aircraft so innocuously???

Numerous gadgets are spoken of, but none play even a passing role in the story, except as filler (in blueprint form) for the chest. There is a "tidal engine" used to harness wave power, an automatic railroad train brake that is applied by track signals, the gyroscope air flier, and a "mammoth telescope" which is realized 11 years into the future in Vol. # 39 of the series. (This is remarkable planning at G&D, if the idea really was in the files for possible future stories...)

Commentary on Society, Attitudes, Environment & Errata

It's amazing how much technology and society have changed. As with *Great Oil Gusher*, this particular old Tom Swift Sr. episode has little to do with actual invention(s) and much more with personalities and social conflict rather than any gadgets. Society's attitudes (or at least the authors') are changing, constantly, too. I wonder what people will be taking for granted 100 years from now, and what they will think of our "modern" society and its' mores (or lack of them...)

Attitudes and Prejudices: It is said that Tom possessed large denomination cash that was yellowish in color. This was probably some of the following:

National Gold Notes - There were two factors that held heavily in the creation of National Gold Notes which originated exclusively from banks in California. As the gold rush of the 1840's brought massive amounts of this metal out of the ground and into barter, it rapidly found its way into coinage. California banks being so inundated with both raw gold and gold coins, it petitioned the government for the authority to issue Gold Notes that could be substituted for the actual coinage. It was on July 12, 1870 that Congress voted giving the right to issue such notes to nine banks in California and Kidder National Gold Bank in Boston. However, while Californians rushed to print this yellow-toned paper, no such effort was ever undertaken by the Boston counterpart.



This and 4 other types of Technicolor "artsy" cash certificates were in circulation at the time of the story. Denominations were in the form of \$1, \$2, \$5, \$10, \$20, \$50, \$100, \$500, \$1,000, \$5,000 and \$10,000. The notes were huge. The visual, above is about 2/3 actual size. The popular "greenback" in its smaller current size did not become *de rigueur* until after 1928.

Mary Nestor and airplanes: This girl will be the death of Our Hero. She has the unique ability to cause aircraft motors to stop running and levers and other parts of the plane to break or malfunction. In this tale, the motor quits while she and Tom are joyriding over (of all things) a forest fire. Their conveyance becomes toast, and they have to hole-up (literally) in a cave to avoid becoming crispy critters, themselves. There's also the issue of breathing-even in a cave, unless it were very deep, they would suffocate, since the fire would consume all the local oxygen, and superheat the remaining inert gasses.

Ford (as in Henry) is mentioned twice in the tale, once in reference to his farm tractor, and again later with reference to the "Tin Lizzie" Model-T auto. Tom thinks it would be unwise to go head-to-head with him in business matters, as he (Ford) "already has much of the market sewed up."

On p167 Koku goes armed with a rifle when a burglar alarm is set off. Considering his recent more-than-usual bloodthirsty attitude and repeated threats of "death to Tom's enemies," I wonder if this is wise.

In spite of the above item, the overall attitude in the story is pacifist, and this is an important *clue* (the old spelling is now being used, again) as to the identity of the author. *Piazza* is also used, but I think this term has now been adopted by more than one author. Another important factor is the geographical descriptions of the landscape around Shopton. See **Geography**, below.

Errata: There is a running gag throughout this series. Mr. Damon's home keeps flip-flopping between Waterford and Waterfield, NY. Sometimes it is in neither, and several times in both places, at once. This is partly due to the enforced poor communication amongst the many ghostwriters at G&D that contributed to this series.

There are now 4 distinct categories. In this tome Mr. D's home is in Waterford.

The tally for 28 volumes, to date is:

Waterfield-13, Both places-2, Waterford-8, and Neither place-5.

Typos and malapropisms were minimal. Blodgett's name was spelled both with and without the final "t" on p85. That was it.

Tom flies through a thunder storm in his lacquer painted wood and canvas kite. That he survived, I expect, is **Engineering Fantasy**. It certainly was an **Error** in judgment, so I put the comment about it here. Old pilots get to be that way by avoiding thunder storms, (or forest fires) not by going thru them.

Speaking of airplanes, it is said Koku cannot fly the *Black Bird*. It is specifically stated that he was taught to fly a biplane, in Vol #16 *Giant Cannon*. Maybe he forgot how?

Engineering and Science, Fact vs. Fantasy: The Gang of ? makes their getaway from the Swift works in a generic touring car. At that point in the story, it is said there are eight of them. Eight men at a *conservative* average of 150# each, plus 400# Koku, plus a 250# chest totals up to a one-ton load. Boy, they don't make cars like that, today! The average full-size SUV is technically "overloaded" with just 4 passengers and vacation luggage. (Check the sticker in the glove box, if you don't believe me!)

Better living through chemistry is what DuPont used as their marketing slogan. Whatever the drug that was used on Koku was, it worked Hollywood fast and thoroughly well. For all his ferocity, this giant is getting downright unreliable as a watchman.

Tom's father wishes he could see the perp (See Vol. #17 *Photo Telephone*) when he gets a phone call from the bad-guys that stole the his son's chest. He seems to have forgotten the special "Selenium sending plate," bright lights and 3-wire hookup needed at the other end to make the device transmit a picture.

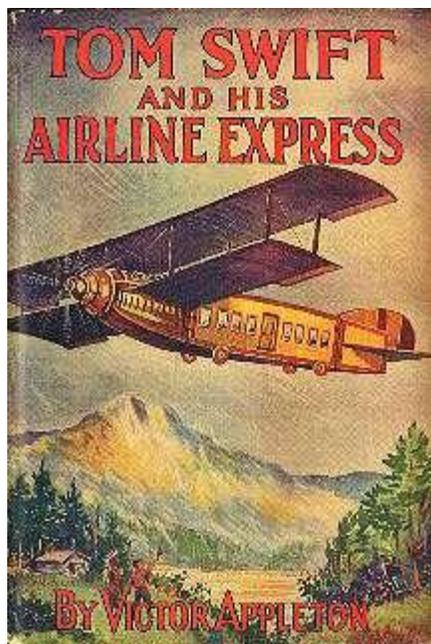
Geography: There is now, no longer any place close to Nestors' house to land a plane. Shopton must be growing at a fantastic rate-or Tom's repeated ups and downs have caused laws to be passed regulating such things. *Lake Carlopa* has returned, with a landmark called *Chestnut Point*. The topography of 1920's upstate New York, remains consistent, with some pretty desolate wooded country (Adirondack Mountains) being described west of Shopton.

JP Karenko 9/28/05

#29. Tom Swift and His Airline Express (1926)

or, From Ocean to Ocean by Daylight

Review by JP Karenko, October 2005



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

The neighborhood is still in the hand-basket headed for Hell. This is another tale of industrial espionage, extortion and theft. In spite of *Swift Construction's* electric fences, alarms, watchmen and guarded gates, Tom is waylaid, drugged, shackled and beaten by a couple of disgruntled ex-employees in cahoots with the "Hooded Two." These miscreants seem to think that Tom's latest brainchild, The *AirLine Express*, is their idea and try to prevent Tom's success by various nefarious means. This revolutionary concept will allow travel from coast to coast in a single 16 hour day, using a concept for all purposes similar to the old *Pony Express*, but with wings.

In addition, to criminal human factors, there are the usual hazards of air travel to be overcome: foul weather, mechanical breakdowns, fire and a pair of quarrelsome stewardess-wannabes, Rad and Koku. (Lost luggage has not yet been invented.)

How these problems are resolved, you will have to locate a hard cover copy of the book to find out.

Cast of Characters (More or less in order of appearance)

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. In this tale we find his pockets contain metalworking files and chocolate.

Trapdoor Ted, the Khloroform Kid--No name or description. Likely one of the Gang of Four. Never positively identified. See below.

Ned Newton--Chum & companion of Tom. No description given. He continues in his position as Swifts' financial advisor and CFO (Treasurer) of Swift *Construction Company*. In this tale, he has once again moved into the Swift manse.

The Gang of Four: -or two, or five... See below.

Kenny--NLN or description. Ex-Swift employee, discharged "because Tom didn't like his looks."

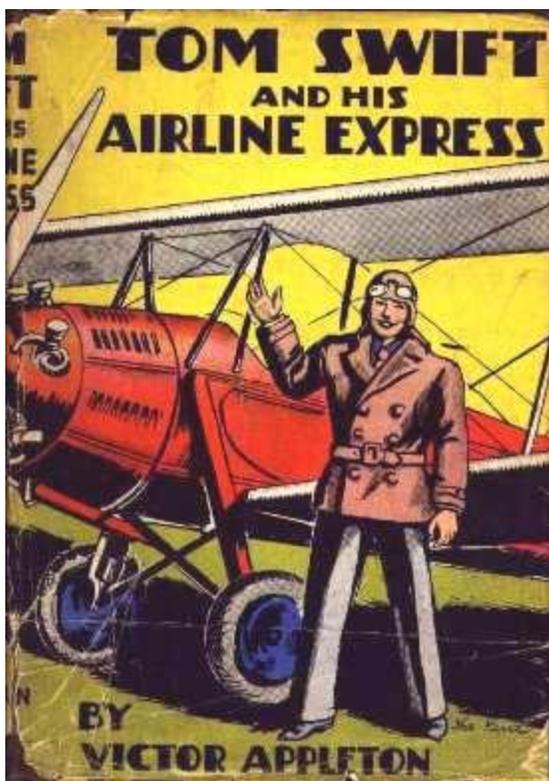
Schlump--NFN or description. Ex-Swift employee, discharged "because Tom didn't like his looks."

Masked Marauder 1--No name or description, except knows Blodgett.

Masked Marauder 2--No name or description, except knows Blodgett.

Lonely House Guy--No name or description. See also, below.

Mrs. Baggert--Swift's aged housekeeper. In this tale, she is back to her usual demure and practical self. No longer the hysteric of the previous episode.



Barton Swift--Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. In this episode, he is described simply as aged. Mr. Swift, has enjoyed improved health of late, and is now working on a book about inventing. We also find he wears glasses. Not surprising for someone of his advanced years. On the dust jacket of *Chest of Secrets*, his appearance is remarkably like that of Robert E. Lee.

Miss Mary Nestor--Betrothed love interest of Tom who lives on the east side of Shopton. Described as a "very pretty young woman with flashing brown eyes, and a sweet trilling laugh." Blushes easily, especially around Tom. Also described as "plucky."

In this tale, makes an overnight trip with Tom to Washington DC, in violation of the 1910 Mann Act. (Hanging out with an inventor would be considered "debauchery" in those days...)

Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited cognitive facilities. Described as "savage and only half-tame," he is antagonist and rival of Eradicate. In this episode, he is nothing but comic relief, antagonizing and scrapping with Rad.

Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro manservant. "Eradicates dirt." Eradicate has now "become too old to do much," As described, he now has "white hair in a fringe and is bald on top..." He remains faithful to Tom and helps out where he can. Constant rival and antagonist of giant Koku. In this tale, he nearly sets the aircraft on fire, when his pie burns up in the on-board galley.

Mr. (Amos) Nestor--Mary's father. In spite of major roles in several of these adventures, his description is never given, and his first name was only mentioned in passing, in episodes #1 and #6. Walk-on part in this tale.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. Never fully described, except as "portly" with a moustache and "tortoise-shell glasses." Appears to be quite wealthy. Back to his old hobby of crashing things, again. This time, he bends a brand-new airplane around the dirigible mooring mast on *Swift Construction's* airfield.

Greasy Spoon Gus--*Chef de Cuisine* at an all-night eatery in Waterfield. Keeps a revolver on hand to discourage robbery (or complaints about his cooking?) Walk-on part.

The Lonely House Guy--No name or description, except as a 5th cohort of the "Masked Two"/ Gang of Four. See below and above. Walk-on part.

David Knowlton--No description, except a farmer who takes in a disheveled and injured stranger (Tom). Willing to brandish a shotgun to prevent bad guys from recapturing Tom.

Sarah Knowlton--No description, except kind and solicitous farmer's wife.

Dr. Prouty--No first name or description. One of many typical faceless medical men that seem to pervade the Shopton area. Practices in Birchville, NY.

Hired Hand Hank--No actual name or description given. Works for Knowltons. Walk-on part.

Nasty Nasal Number-Please Nancy--No actual name or description given. Semi-snotty telephone operator, who is reluctant to try and trace a call made by Tom.

Bob, the Bell Boss--No actual name or description given. Nasty Nancy's supervisor. Wants to help trace Tom's call, but is hampered by the technology of the times.

Damon's Domestic, Debbie--No actual name or description given. This twit lets bad guys into the Damon household, unannounced. Walk-on part. Soon to be unemployed, I suspect.

Soliciting Stranger Sam--No actual name or description given. Enters Damon's domicile on the pretext of looking for employment. Bad guy. Suspected cohort of "Masked Two."

General Malcolm--NFN or description. Washington chair-warmer who is "an old friend" of Barton Swift. Attempts to get Tom's patent application moving through the already semi-ossified bureaucracy in the USG/Patent Office.

Helen Morton--No description, except friend of Mary Nestor. Hangs with and on Ned Newton. Future love interest of same.

Jason Jacks--Old fashioned, aged, homely, toothless and ornery Shopton millionaire. Just happens to be around and in need of rescue, when Tom could use a few shekels to get his new invention's prototype built. Has no use for modern machinery.

Paulie, the Plunging Palomino Pony--Runs away with Jason Jacks on a mountain road. Ends up as dog food at the bottom of a ravine, for his efforts. Note to the PETA types: At least one animal was injured and killed in the making of this story. Nobody bothered reporting it...I also suspect Mary Nestor wears *fur*.

The "Masked Two"--Revealed in the final chapter as Blodgett and Fawn, the bad guys from *Chest of Secrets*. They are the ringleaders of the gang supposedly after Tom's ideas. They are now on a revenge trip. Assault & battery,

kidnapping (with drugs), extortion, arson and use of explosives are all in their bag of tricks. The Feds are gonna have a *field day* when this bunch is finally brought to justice...Oh, and they are out on parole, too.

This is Your Captain Speaking:

Presenting the Commander(s) and crew of the *Swift AirLine Express*:

Chief (and only) Steward--No actual name or description given, except Negro.

Rad Sampson--Head cook and comic relief.

Koku--Comic relief. Never does anything but argue with Rad and act as ballast.

Aircraft *Falcor*: Leg 1-Long Island to Chicago--Harry Meldrum, Chief Pilot. Bert Dodge, Co-Pilot.

Aircraft *Eagle*: Leg 2-Chicago to Denver--Sam Stone, Chief Pilot. Jim Waldo, Co-Pilot.

Aircraft *Osprey*: Leg 3-Denver to San Francisco--Ted Dolan, Chief Pilot. Art Wright, Co-Pilot.

None of these characters rate a description or any development. They are introduced and discarded after they do their bits to make the story flow. I think the poor Steward, having to put up with Tom & Co, at least deserves Honorable Mention.

Airfield Manager, Chicago--Possibly named O'Hare. Ex-Army flier and radioman.

Numerous Nosy Newsmen--They crowd the landing field and get underfoot, whenever the aircraft lands. "Industriously hand-cranking their movie cameras," it seems the Swift *Wizard Electric Camera* never caught on??? (See Episode #14) Knowing the value of good publicity, Tom puts up with them, but he does have to "buzz" them to clear a spot to land during one stop.

Major Inventions

In a nutshell, the Swift *AirLine Express* (ALE) is the *Pony Express* but with wings instead of horses. Instead of passing a mail pouch from horse to horse, a Pullman-type passenger car is passed from airplane to airplane, railroad-style. Crew changes are made with the aircraft. Up to 10 passengers at a time can fly coast-to-coast in one 16 hour day.

No real technical details were explored in the story, as the device was not even introduced until halfway through the book. The specifications and engineering are typical Swift Fanciful. The ALE can go twice as far (1000mi), twice as fast (200mph) and with (at least) twice the luxury and comfort of the then-current competition. (See below.)

Commentary on Society, Attitudes, Environment & Errata

It's amazing how much technology and society have changed. As with *Great Oil Gusher*, this particular old Tom Swift Sr. episode has less to do with actual invention(s) and much more with personalities and social conflict rather than any gadgets. The actual device that the story is "about" is not even introduced or described until more than half-way through the book. Society's attitudes (or at least the authors') keep changing. It's also apparent that the world outside the small burg of Shopton is changing dramatically and rapidly. Technology is catching up with and in some cases has surpassed the insulated universe that Tom lives in. The first all-metal airplane (forerunner of the Ford Tri-plane,) was invented two years before this one, built by *Swift Construction*.

I wonder what people will be taking for granted 100 years from now, and what they will think of our "modern" society and its' mores (or lack of them...)

Attitudes and Prejudices: Once again, the bad guys (as many as 5 of them!) go armed. Two wear black hoods in public. (Well, when they *are* out on the lake in a boat, but can you say inconspicuous???) Tom, wisely runs away from them, but bypasses potential rescue so as to be able to claim he got away without help. The "logic" here, was to make the circumstances (4 on 1) "*sportier*." I begin to think that repeated electrocution, blows to the head and druggings have made the screws in Tom's head, a teeny bit loose. This is beyond foolhardy. It borders on suicidal. He pays for it later, with additional maltreatment at the hands of the bad guys. Serves him right, as far as I'm concerned.

An important *clue* (the old spelling is now being used, again) as to the identity of *yet another* new author, is the extensive use of *rumination*, *analysis* and *introspection*. These new kinds of literary devices that make up the story are a giveaway. This tale positively *reeks* with a remarkable string of *coincidences* that are required to allow the story line to progress. Other tomes have also used extensive *foreboding*, bordering on clairvoyance. Another important factor is the extended geographical descriptions of the landscape around Shopton. See **Geography**, below. I think this one was written by Harriet Stratemeyer, daughter of the series' originator. It feels like it has a woman's touch, to me. It's said she took over control of the series, about this time.

Ned Newton has a girl friend! Helen Morton has sprung from the loins of the author, full-grown and feisty. Ned has a thing for girls named Helen, having hooked up with Helen Randall in Episode #18 and Helen Sever in Episode #21. This gal thinks highly enough of him to "go out on a date," and shortly thereafter make an overnight trip to Washington, DC with him. Wonder if he and Tom can get adjoining cells for violating the Mann Act??? Oh, the reputations that are being ruined in these stories...

Errata: there is a running gag throughout this series. Mr. Damon's home keeps flip-flopping between Waterfield and Waterford, NY. Sometimes it is in neither, and several times in both places, at once. This is partly due to the enforced poor communication amongst the many ghostwriters at G&D that contributed to this series.

There are now 4 distinct categories. In this tome Mr. D's home flips to *Waterfield*.

The tally for 29 volumes, to date is:

***Waterfield*-14, both places-2, *Waterford*-8, and neither place-5.**

Typos and malapropisms were minimal. On p158, a news-reel (reel) was referenced, and on p163, Tom pulls a level (lever) to actuate a fire alarm.

Engineering and Science, Fact vs. Fantasy: *Better living through chemistry* is what DuPont used as their marketing slogan. Whatever the "dope" that was used on Tom was, it worked Hollywood fast and thoroughly well. He was "out" all night long. The aftereffects of Ether and Chloroform don't last that long.

Tom's is imprisoned below ground in a tunnel that runs for several miles from *Swift Construction* out to a small island in *Lake Carlopa*. This is described as a "natural" tunnel, but with an arched roof and a flat smooth floor. It is remarkable formation, connecting two improbable locations, and travels under a typically deep lake for several miles. Coincidentally, it stays remarkably dry. A veritable Wonder of Nature or maybe the pipe dream of someone who had never been farther underground than a root cellar, these formations are generally only found in Southern California, and then only on movie lots.

In a nutshell, the Swift *AirLine Express* is a Pullman-type passenger car passed from airplane to airplane, railroad-style. Crew changes with the aircraft. This was a revolutionary idea for the time, as going coast to coast at the time normally required the use of several short range (500mi) aircraft with much delay. Since things like jetways and ambassador clubs had not yet been invented, dragging ones' self and luggage out of a cozy recliner and walking in the elements to a second or a third plane was not the way to treat wealthy and important passengers (the only kind that could afford such travel in those days.) Swapping out crews and propulsion units was almost a practical possibility. The author just wasn't familiar enough with the limitations of 1926 flight technology to make it sound plausible to an engineer, though. If speed (and comfort) was the purpose of this exercise, making the passenger car self propelled would add unnecessary weight and complexity to the vehicle. A simple tractor or tug vehicle at the airport could move the passenger car on the ground from plane to plane more simply and with less load to carry over stormy mountain heights.

As it was, the *air-line* (straight & point-to-point without having to follow rails, rivers or roads) *express* (quick and straight through without delay or "local" stops,) would have been an attractive alternative to railroad, the fastest method for transcontinental travel of the day. A coast to coast rail trip in 1926 took several days, with 18 hours from New York to Chicago being considered "speedy." Some Folks Just Can't Wait That Long to "do business." Tom could make the entire trip in 16 hours at the unheard-of sustained speed of 200+mph! A few years (and episodes) previously, a 100mph aircraft was considered a "marvel of the age." Technology marches on!

Tom's brainchild consisted of two main parts, the power unit (I'll include the "tail feathers" and controls with it.) and the passenger car.

Power Unit-In the dust jacket and frontispiece illustrations, we see that the wings were bi-plane configuration. Old-think! The self-contained power unit had all the mechanical "stuff" necessary to fly, and a place for the pilots to reside. Why in Heaven's name the crew were subjected to the elements in exposed cockpits I cannot fathom. Enclosing them in a cozy, heated and pressurized cabin would add much to the safety, health and welfare of all aboard. *The Flying Boat* (See Episode # 26) had an enclosed cockpit. The illustrator also shows a single motor/propeller on the ALE, but the text indicated that there were two, at least in one place in the story. This would be a much safer configuration, considering the reliability of even Swift-built machinery. Ford (see below) specified three motors for safety. You could lose one, and keep flying. Dual oil pumps were incorporated in the ALE after a near disastrous test flight. Flotation gear was also incorporated, since the first official (and unintended) landing was in *Lake Carlopa*.

Passenger Car-Room for 10 plus crew in typical Swift Spartan Style. (i.e. swanky-luxurious.) Fold-down berths for sleeping (although why these would be necessary, as the flight was dawn-to-dusk in daylight only, escapes me) cushioned easy chairs and a buffet kitchen and dining room, "with many conveniences." (Perhaps a porta-potty? I hope so!) These planes now have voice "radio," rather than just "wireless," for the convenience of both passengers and owner. These sets are unusually powerful and able to make transcontinental calls. Perhaps they were the newfangled "short wave" sets? (In reality the first privately owned voice radio installed in an aircraft was 10 years into the future. These devices were limited to military aircraft at the time.) There is a Swift Designed (I presume) fire-suppression system on board and newfangled "parachutes" are provided for all hands. This is Just In Case Things Get *Really* Out Of Hand. Construction is of Duralumin, a new Swift-improved alloy of Aluminum that is lighter than what is usually available. Tail-feathers (controls) are clamped to the rear of the car, so I presume that control linkages must pass through the structure. From a weight and balance standpoint, the plane as illustrated would be terminally tail-heavy. The luxurious passenger accommodations and the self-propelled car would have to be mounted under the wings, rather than behind them. To fly with any degree of stability, the center of gravity of the plane must be somewhere near the leading edge of the lower wing on a bi-plane. I'd also consider a nose wheel or skid, as putting the main landing gear far back on the passenger car (as illustrated) would make takeoff and landing runs feel like riding a porpoise. Ned would also have a fit at the expense of replacing all those broken propeller blades, as the plane rocked forward during a stop.

Tom's Competition:

Henry Ford mobilized millions of Americans and created a new market with his Model T "Tin Lizzie" automobile from 1909 to 1926. After World War I he recognized the potential for mass air transportation. Ford's Tri-Motor aircraft, nicknamed "The Tin Goose," was designed to build another new market, airline travel. To overcome concerns of engine reliability, Ford specified three engines and added features for passenger comfort, such as an enclosed cabin. The first three Tri-Motors built seated the pilot in an open cockpit, as many pilots doubted a plane could be flown without direct "feel of the wind" (-and rain, and hail, and snow-*macho nitwits!*) After some incidents of frostbite and most likely, the formation of a pilots' union, these unfortunates got to ride inside, where they stayed warm and dry.

Ford Motor Company built 199 Tri-Motors from 1926 through 1933. I had the unique experience of riding in this particular beast, at the EAA Air Show near Oshkosh, WI. A year later (1973) it was nearly destroyed in a thunderstorm. As an engineer, one of the "features" in this craft intrigued me. To read

engine oil pressure on the wing-mounted engines, the co-pilot would lean over the 2nd-row passengers and watch the gages thru the side window of the passenger compartment. I also want to tell you that those wicker chairs were designed by a Sadist. If I had had to spend 16 hours in one, my Chiropractor would be a very wealthy man at my expense. As it was, I think I put *his* kids through college...



Ford Tri-Motor 4-AT-E

Specifications

Length	49 ft. 10 in.
Height	12 ft. 8 in.
Wingspan	74 ft.
Total Wing Area	785 sq. ft.
Gross Weight	10,130 lbs.
Empty Weight.	8,013 lbs.
Engines (three)	Pratt & Whitney R985
Fuel Capacity	234 gal.
Fuel Consumption	45 gal./hr.
Oil Capacity	24 gal.
Stall Speed	64 mph
Normal Cruise	90 mph
Range	500 miles
Price At Factory	\$42,000



"Luxurious" Ford Tri-Motor Interior

It is said Henry Ford never made a profit on his airline endeavors. This does not bode well for the future of *Swift Construction*, especially as the Great Depression is looming 3 years into the future and Ned now selling stock in the company.

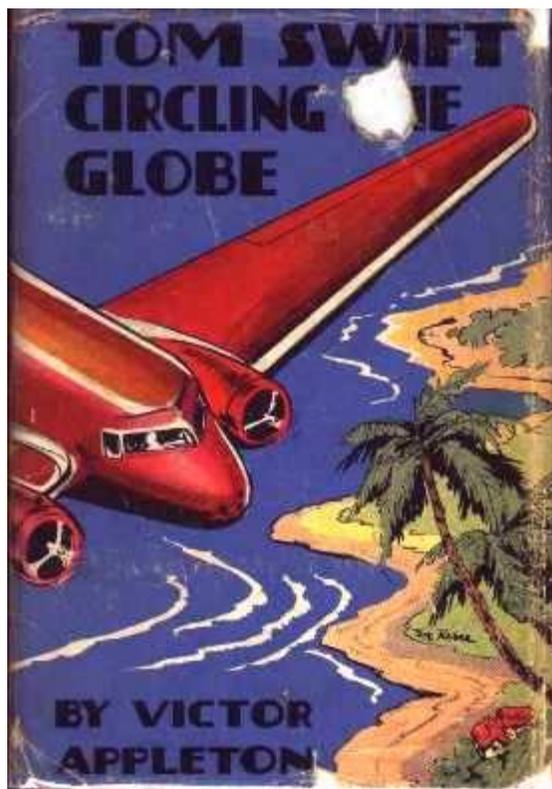
Geography: *Lake Carlopa's* topography is described in more detail, once again. New landmarks, such as *Barn Door Island*, and *Loon Island* are described, as is the (new) location of Shopton-On-The-Shore. It is now said to be located at or near one end of the lake. In early episodes, *Carlopa* was large and narrow with the long axis running North and South. The nearest real-world equivalent in upstate New York would be *Lake George*. Shopton was said to be about one-third up the length of the lake on the East shore. Sandport, a resort town, was at the South end, and Lanton, a small village, was at the North end. The North end of the lake is now described as "swampy." Birchville is said to be about 30 miles from Shopton, and presumably somewhere near the lake, as Tom was transported to the "lonely house" quickly, after his boat ride.

JP Karenko 10/5/05

#30. Tom Swift Circling The Globe (1927)

or, The Daring Cruise of The Air Monarch

Review by JP Karenko, October 2005



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

Too concentrated cigar smoke has made Barton Swift reckless. He starts out this tale betting the then princely sum of \$20,000 that Tom can make a 'round the world trip in under 20 days time'. This task is to be in a contrivance that is only half-designed and as yet, untested. There is also a time limit. The craft must be built and the voyage must be completed before 6 months have gone by.

To add spice, another \$100k prize is added when a New York newspaper hears of the feat and organizes a race to provide some competition for Tom. The *Air Monarch*, a luxurious but speedy "triple traveler," is completed in record time in spite of the evil machinations of rival *Red Arrow Aeroplane Company*. This machine is a flying boat with powered wheels that will let it cruise in the air and on sea & land, too. The basis for the future movie *Those Magnificent Men In Their Flying Machines* is born. They go uppity-up-up...

Hazards abound: They are animal, vegetable, mineral and man-made but how these problems are resolved, you will have to locate a hard cover copy of the book to find out.

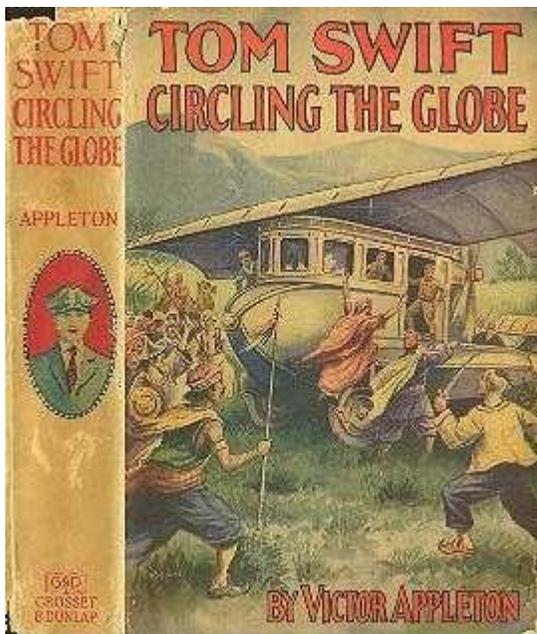
Cast of Characters (More or less in order of appearance)

Barton "Bart" Swift--On the dust jacket of *Chest of Secrets* his appearance is remarkably like that of Robert E. Lee but with glasses. Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. In this episode, he has whipsawed back to being "my son can do anything" enthusiastic about Tom's endeavors. Willing to risk \$20k on a whim. He had, for many episodes, been doom and gloom pessimistic about Tom's future as an inventor. Mr. Swift, has enjoyed improved health of late, and is now working on a book about inventing.

Thornton "Thorny" Burch--No description, but assumed to be a cigar-smokin' fatcat high roller. Retired auto manufacturing executive.

Medwell Trace--No description, but assumed to be another cigar-smokin' high roller. Business associate of Burch, above.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. Never fully described, except as "portly" with a moustache and "tortoise-shell glasses." Appears to be quite wealthy. Previously back to his old hobby of crashing things, again, in this tome, he remains safely out of travel conveyance trouble.



Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro manservant. "Eradicates dirt." Eradicate has now "become too old to do much," As described, he now has "white hair in a fringe and is bald on top..." He remains faithful to Tom and helps out where he can. Constant rival and antagonist of giant Koku. In this tale, he is relegated to the role of gofer and watchman.

Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited cognitive facilities. Described as "savage and only half-tame," he is antagonist and rival of Eradicate. In this episode, he is comic relief and watchman/armed guard at Swift Construction. Continues his other chore of antagonizing and scrapping with Rad.

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical.

Ned Newton--Chum & companion of Tom. His description is never given. He continues in his position as Swifts' financial advisor and CFO (Treasurer) of Swift *Construction Company*. In this tale, he continues residing at the Swift manse.

Miss Mary Nestor--Betrothed love interest of Tom who lives on the east side of Shopton. Described as a "very pretty young woman with flashing brown eyes, and a sweet trilling laugh." Blushes easily, especially around Tom. In this tale, she continues to use her ability to stop the motors of airplanes, instigating a crash into a cranberry bog.

This is her third incident while riding the unfriendly skies with her lover.

Joe Hartman--Tall Veteran flier from "The Big Fuss" (WW1). Working in a Waterford garage as an auto mechanic. Pulls Tom & Mary out of the swamp after their plane crashes.

Bill Brinkley--Short Veteran tanker from "The Big Fuss" Working in a Waterford garage as an auto mechanic. Helps pull Tom & Mary out of a swamp after their plane crashes.

Cal Hussy, AKA "**Leghold Larry**"--Burly, ugly and "lowering" thug. Spy/sneak thief for *Red Arrow Aeroplane Company*, dresses as a mechanic and is caught in a bear trap Tom sets for burglars. Catches Tom's boot in his drawers as he escapes through a window from the *Monarch's* hangar.

Armenius Peltok--Comes out of nowhere. Quiet, reserved, physically strong and educated in many languages, he hires on as crew chief /mechanic and interpreter for the RTW race. (I smell a severe future need for these unique qualities in order to keep the story flowing later. We shall see.)

Jason Jacks--Old fashioned, aged, homely, toothless and ornery Shopton millionaire. Rescued by Tom in the previous episode, he provides financing when Tom could use a few shekels to get his new invention's prototype built. Has no use for modern machinery.

Convenient Cal, the **Thumping Thug**--Never positively identified, but may be Cal Hussy, (See above) looking for payback. Mugs Tom when the *Electric Runabout* runs out of juice after the batteries are sabotaged.

Mr. Goodrich--NFN or description. Cigar-smokin' neighbor of Nestors.

Dr Blake--Typical faceless medical man, used and discarded in these stories.

The Competition--

Jed Kimball--No description. County "Fare" race pilot at the controls of a "hydroplane" (flying boat.)

Bob Denman--No description. Rich kid, using hired commercial transport.

Professor Modby--No description. Aeronautical scientist/mad hatter, flying a swamp-gas powered dirigible named *Cloud*.

Dan Kilborn--No description. Loud, boastful WW1 flying ace. Cheat and sneak thief. CEO of *Red Arrow Aeroplane Company*. Flying hydroplane of same name.

Harry Walton--No description. At the controls of another "hydroplane"

Those Magnificent Others In Their Flying Machines--No descriptions or names. Probably as they never were serious competition.

Mr. Elliot--No description. Managing Editor of *New York Illustrated Star*. Organizer and MC of Round the World (RTW) Race.

The Nocturnal No-Goodniks--

Cal Hussy--(See Leghold Larry, above.) Goes armed and is wounded by Koku during breaking and entering (B&E) at *Swift Construction*.

B&E Bob--Never identified. Stranger and accomplice of Hussy, above.

Garrett Jackson--No description given, but is spry and fit for his age. (Original volumes described him as "aged.") *Swift Construction* Shop Manager/General Foreman.

Mr. (Amos) Nestor--Mary's father. In spite of major roles in several of these adventures, his description is never given, and his first name was only mentioned in passing, in episodes #1 and #6. Walk-on part in this tale.

Mrs. Wakefield Damon--NFN or description given. While she was routinely nearly always willing to let her husband do as he liked, in this tale she has tightened his leash. Says Mr. D "is too old to go traveling with Tom Swift," any more.

Helen Morton--No description. Future love interest of Ned Newton introduced in the previous episode, does not show up even to see Ned off, but is sent mail and souvenirs anyway.

The Trigger-Happy Turkish Tribesmen--Cast of numerous horsemen who use *Air Monarch* (AM) for target practice. Wound Tom and puncture AM's radiator. Nasty, dirty and vicious.

Yelling Yellow Gypsies--Wild and evil looking tribesmen, dressed in "gay, but fantastic" clothing. Located in Persia, they may be related to today's Kurds. Nastier, dirtier and more vicious than the Turks, above, at least in this tale.

Persian Pony Police--Mounted military forces of some unknown warlord. When the AM is attacked, they come out of nowhere and run off the Gypsies, above.

Yal, the Mongolian Mail Man--Runs the local post office in a burg named Yarkand.

Cranky Chinese Constables--Try to arrest Tom and Ned for landing AM "without a permit." (Y'know, the kind of permits that fold and have pictures of presidents on them.)

Belligerent Beijing Bandits--Nastier, dirtier and more evil than the gypsies, above.

Ming the Mercenary--Faceless Chinese extortionist/bureaucrat who squeezes Tom for cumshaw, when a gas/oil pit-stop is needed.

Menagerie of Malay Marauders--Sea-pirates of the war-paint and feather variety. Require a white virgin to sacrifice to the local (volcano?) god. Tom declines the honor, even tho' likely well-qualified. More evil and nastier than the Beijing Bandits, above.

Hairy Head-Hunters--Bones, feathers, paint, uncouth, unwashed, unclothed. Bad news. Get the picture? At the very top of the evil and nasty scale. They *eat* people!

"Shipwreck" Sam Stout & "Mad" Frank Madler--No descriptions given. Sole survivors of a storm-wrecked schooner carrying lumber. Rescued by Tom & Co. Six other castaways from the wreck didn't make it and are now fish-bait.

Honolulu Harry, the Keystone Cop--Faceless gumshoe. Bungles the arrest and lets Tom escape from custody after he is accused of attempted murder by Dan Kilborn.

San Fran Sam--Faceless President of the San Francisco Chamber of Commerce. Wants Tom to call a time-out in the race, so he can attend a ceremonial dinner.

As is usual lately, many of these characters (especially the ones introduced late in the story) do not rate any development or even a description. They are brought forth and discarded after they do their bits to make the story flow.

Major Inventions:

In a nutshell, the Swift *Air Monarch* is a flying boat with powered wheels that will allow it to travel on land without using the airscrews. It is a bi-plane configuration with multiple pusher motors (See Errata) of the "V-type." The power of each engine is rated at 690hp @2700rpm, when running on a special high-octane Swift developed gasoline derivative. The *Monarch* has a streamlined waterproof hull, with bronze propeller for water travel and 4 powered wheels that give it limited overland capability. There are at least four main compartments: a pilot house forward, Tom & Ned's cabin/stateroom and an observation room/crew berth/galley, amidships, and equipment/motor room, aft. No mention of where stores or fuel/oil are kept was mentioned.

The specifications and engineering are typical Swift Fanciful. *Air Monarch* is big, heavy and luxurious, but can go twice as fast (250mph) and with (at least) twice the luxury and comfort of the then-current competition. It also sports a plate glass window in the floor for observation, a binnacle compass for navigation, a mercury tube barometer and a spoked steering wheel, possibly of the sailing ship variety.

While there are non-lethal ammonia gas dispensers fore and aft for "crowd control" in hostile territory, various firearms (including a machine-gun) are carried aboard.

Commentary on Society, Attitudes, Environment & Errata

It's amazing how much technology and society have changed. Shopton, *Swift Construction* and environs remain consistent, but in spite of alarms, guards and electric wires, the bad guys come and go as they please. All the literary baggage dragged out in the previous episodes (except *coincidence*) is discarded. We are back to an author that has filed the serial numbers off a current event (RTW trip) and is attributing it to Our Hero. He is also trying to describe a device (the Triple Traveler) that he knows little or nothing about, and is not even doing it consistently from chapter to chapter. (The number of motors on this beast varies from one to three.) In today's world, a circum-planet journey in 20 days sounds like a cheap whirlwind tourist trip. Too many countries and too-few days...

I wonder what people will be taking for granted 100 years from now, and what they will think of our "modern" society and its' mores (or lack of them...)

Attitudes and Prejudices: Some *clues* that were detected as to the author of this tale: This tale *reeks* with a string of *coincidences* that are required to allow the story line to progress. The story also requires extensive *foreboding*, bordering on clairvoyance, to prepare for travel travails. Characters are introduced and discarded in wholesale groups. The author's engineering knowledge of aircraft is minimal, but the features of the *AM* feel familiar. The circumstances & hazards on this trip are also very reminiscent of the *Air Glider Voyage*. (See Vol #12) I'd hazard that this author was the same as #12's, who I called "Frank Dixon," (The author of G&D's *Hardy Boys*.) The similarity in writing style and attitudes is, in my judgment, pretty conclusive. Aside, the author is also an old temperance man, as the *AM* gets christened with ginger ale, rather than Champagne.

Tom is working on inventing the "Mile High Club." Comment is made that "love-making cannot be conducted in shouts," while he & Mary are on a plane ride. Mary also "stops the clock" on her third airplane. (Something about this girl makes airplanes crash.) This time they fall into a cranberry bog, where she and Tom almost drown in quicksand. Since this is her third strike, I feel it's time for her to hang up her goggles.

Rad and Koku are no longer called "boy" or other denigrating terms, but the indigenes encountered during the trip are all treated at best, as ignorant savages. Speaking of Rad and Koku, they are left behind in this tale. Perhaps Tom has had it with their constant bickering? A new and well-muscled character, one Armenius Peltok, shows up. Tom hires him solely on the basis of an unsolicited written recommendation he submits. Sounds foolhardy, but his many skills are needed to make the story flow, later in the tale.

Does Ned Newton still have a girl friend? Helen Morton, introduced in the previous episode as a pretty serious love interest for Ned, didn't even show up to wish her sweetie a *bon voyage*. She does make an appearance at the finish line, and gets a "souvenir."

Tom has upgraded his firepower. He now keeps an "automatic" in his bedroom nightstand for repelling burglars. Koku actually shoots a nocturnal prowler, and the *AM* carries not only small arms, but a tripod mounted machine gun. It gets used, too, doing a "fearful slaughter" amongst some Micronesian head-hunters.

At the conclusion of the story, Tom & Ned get a reception dinner, the girls get expensive gifts, Bart wins his bet, and the Monarch's mechanics (the real heroes of the tale) get to clean up the mess that is the worn-out Triple Traveler. Some things never change...

Tom punches out both a Honolulu cop and Dan Kilborn when they try to nab him on a trumped-up attempted murder charge. I wonder if the felonious assault charge the cop would file is still on the books? Tom may have to avoid Hawaii in future voyages...

Errata: There is a running gag throughout this series. Mr. Damon's home keeps flip-flopping between *Waterfield* and *Waterford*, NY. Sometimes it is in neither, and several times in both places, at once. This is partly due to the enforced poor communication amongst the many ghostwriters at G&D that contributed to this series.

There are now 4 distinct categories. In this tome Mr. D's home **flops** back to **Waterford**.

The tally for 30 volumes, to date is:

Waterfield-14, Both places-2, Waterford-9, and Neither place-5.

Typos and malapropisms were almost nonexistent. Only one popped out, the description of Jed Kimball flying in "County Fares" (*Fairs*) on p72.

Factual stuff, though...Tom refers to a previous round the world trip made by Navy fliers-it was the Army (Air Corps) that did the RTW trip in 1924. See timeline, below.

When Tom & Mary crash in a bog, he has her unbuckle her seat belt and stand up in the plane "to lessen the impact." They splash down, safe, in spite of the reason for the crash being a loss of control/high-speed dive.

Turn-of-the-century Persian Boondock roads are smooth and level. (We need some of those folks to come here and design roads in Michigan...)

"Typhoons are the worst of hurricanes, but they do not last long," is Tom's wisdom. Tom & Co. fly *in and out* of a class 5 storm in a matter of a page or so, with clear balmy weather on both sides. I also get the feeling that anything bigger than a thunderstorm is considered a "hurricane" in these tales. Hurricanes and rogue whales seem to be course hazards on Tom's trips. He almost collides with one of those on this voyage, too, but has no *Electric Rifle* available to disintegrate it. (*Oh, Bother!*) Oh, it's also *de rigueur* for Tom to "rescue" someone, *anyone*, at least once per episode. The ocean castaways add nothing to the story, but reinforce Tom's well-known reputation for compassion.

Engineering and Science, Fact vs. Fantasy-

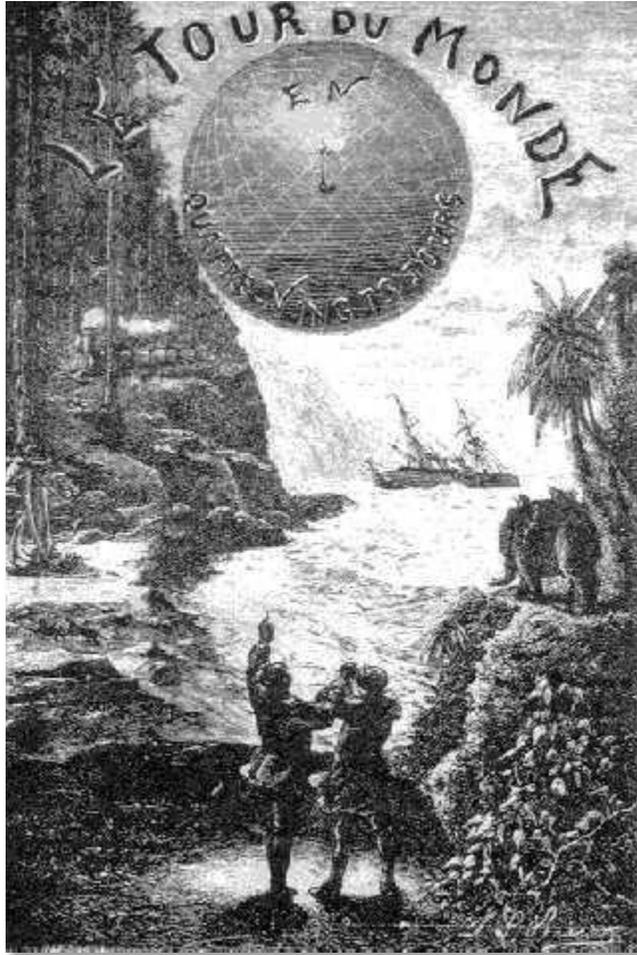
Tom's octane boosted gasoline is considered to "supercharge" the motors, a la Popeye's Spinach. I'd think a Rootes blower would be needed to really boost the horsepower in the *AM*. Octane by itself is pretty much wasted without a compression ratio increase.

The *AM* uses a system of external oil lines, in a wasteful but typical feed and leak configuration. Recirculating lubrication systems were a few years away, yet.

The author's lack of familiarity with airplanes bit him again, when he described a takeoff run with the elevating planes being moved in a direction that would have caused an instant crash. More likely, he got confused (or forgot) about the elevator being in the rear of the craft. Had it been up front, like on the *Wright Flyer*, the description would have been accurate. The bit about standing up during a crash was a stitch, too.

RTW Timeline-Around The World in 80 Days...or was that in *minutes*?

1873 Phileas Fogg and Passepartout circumnavigate the globe in **80 days**, traveling in a balloon.



Le sac d'air chaud de Phileas Fogg

1913 John Mears' record of 'round-the-world in **36 days** was set without the benefit of flying machines.

1924 From April 6 to Sept. 28, United States Army aviators Lts. Lowell Smith & Leslie Arnold, made a 'round-the-world flight. Actual flying time was **15 days, 11 hours, and 11 minutes**, but it was over a period of 175 days, so it doesn't really count.



Lieutenant Lowell Smith and his crew.

1927 Tom Swift, Ned Newton and crew go 'round the world in **19 days, 11 hours, 15 minutes, and 11 seconds.**



Tartar Travelers' Aid Society

1929 The *Graf Zeppelin*, LZ-127, made a world flight. It took **21 days, 7 hours, 34 minutes.** I presume it was by a longer route, with fewer stops to fight off "indians."



The Graf Zeppelin LZ-21

1931 Wiley Post and navigator Harold Gatty circled the globe in the *Winnie Mae*, a Lockheed Vega. Traveling over 15,000 miles, the pair didn't sleep for **8 days and 16 hours**.



Wiley Post and Winnie Mae

1938 Howard Hughes circumnavigated the globe in record time, **3 days, 19 hours, and 8 minutes**. He averaged the 250+mph that Tom had hoped to go during his trip.



Howard Hughes at Bennet Airport July 10, 1938

1949 Capt. James Gallagher and USAF crew of 13 flew 23,452 mi in **3 days, 22 hours, 1 minute**. This time is longer than Hughes' flight, but the military flight was over a longer distance.

1957 Maj. Gen. Archie J. Old, Jr., USAF, led a flight of three Boeing B-52 bombers, around the world in **3 days, 9 hours, 19 minutes**; a distance of 24,325 mi; average speed 525 mph. They flew a route closer to the Equator than the "40th parallel."

1961 On April 12, aboard the spacecraft *Vostok 1*, Soviet cosmonaut Yuri Gagarin became the first human being to orbit the planet, a feat accomplished by his space capsule in **89 minutes**. He still holds the record today.



Comrade Yuri "Speedy Slav" Gagarin

Geography: Tom Swift's 'round the world route: Long Island NY, Lisbon Portugal, Spanish Mediterranean, Lower Italy, Northern Turkey, Northern Persia, Yarkand Turkistan, Southern Gobi Desert, Somewhere in China, Sea of Japan, Philippines/Malay Sea, New Guinea, Honolulu HI, San Francisco, Pittsburg & Long Island NY.



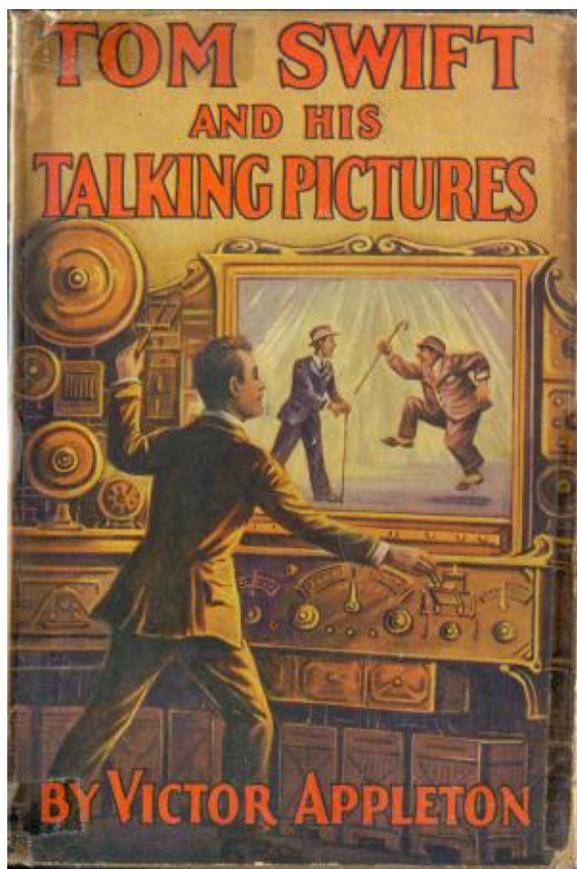
The author has mislaid *Shopton*. It is now "in one of our Eastern states." The local topography is again described in more detail. A new landmark, *Jamison's Cranberry Bog*, is said to be located inland, away from *Lake Carlopa*. It is full of Hollywood style quicksand. (--and one very soggy airplane.)

JP Karenko 10/10/05

#31. Tom Swift and His Talking Pictures (1928)

or, The Greatest Invention On Record

Review by JP Karenko, October 2005



out.

Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

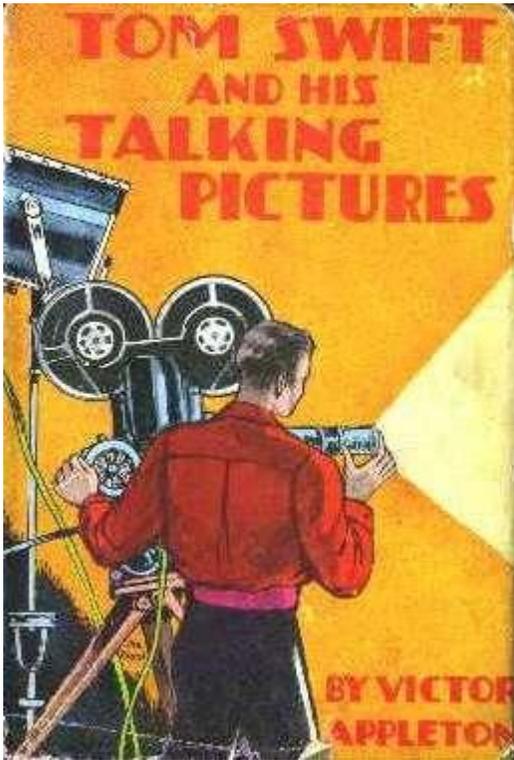
There is an old saw told in Economics 101 about a fellow who owns a buggy whip factory. He hears about this new invention called "the automobile," and he wonders how it will affect his business. His financial advisor tells him "check to make sure your insurance is paid up, and have a nice fire." In a nutshell, this is the central gist of this tale of industrial sabotage, subterfuge and sly shenanigans.

Tom Swift has invented a device that seriously jeopardizes the existing theater and moving picture establishment. It is a large screen color TV with high fidelity sound. The Powers That Be are afraid folks will stay home and watch the tube instead of getting gussied up and paying them to see the latest movies, plays, operas and concerts in their theaters. They will do *anything*, from sabotage and subterfuge to kidnapping and attempted murder to stop this device from being marketed.

Tom survives, but how these problems are resolved, you will have to locate a hard cover copy of the book to find

Cast of Characters (More or less in order of appearance)

Ned Newton--Chum & companion of Tom. His description is never given. He continues in his position as Swifts' financial advisor and CFO (Treasurer) of Swift *Construction Company (SCC)*. In this tale, he continues residing at the Swift manse.



Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical.

Jacob Greenbaum--No description given, but is hired to assist Tom with "sideline devices" such as a "magnetic gearshift device." Apparent brown-nose/go-getter, he tries to ingratiate himself to Tom by being "a good worker." Later found to be a thief, spy and arsonist. Plants a bomb that injures Tom and later attacks him with a knife. Later determined to be insane.

Barton "Bart" Swift--On the dust jacket of *Chest of Secrets*, his appearance is remarkably like that of Robert E. Lee, but with glasses. Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. In this episode, he has whipsawed back to being "doom-and-gloom" pessimistic about Tom's endeavors. Mr. Swift, has once again declined in his health, and is now being attended almost full-time by Eradicate Sampson.

Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro manservant. Eradicate has now

"become too old to do much," As recently described, he now has "white hair in a fringe and is bald on top." He remains faithful to Tom and helps out where he can. Constant rival and antagonist of giant Koku. In this tale, he is personal attendant to Barton Swift and part-time watchman.

Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited cognitive facilities. Described as "savage and only half-tame," he is antagonist and rival of Eradicate. In this episode, he is watchman & guard at SCC. Continues his other chore of antagonizing Rad.

Mrs. Baggert--Majordomo & housekeeper of the Swift Manse. In charge of "several" maids. Mother figure, she loves Tom like a son.

Garrett Jackson--No description given, but is spry and fit for his age. (Original volumes described him as an "aged Engineer.") *Swift Construction* Shop Manager/Superintendent.

Dr. Layton--NFN or description, as is usual for medical men in these tales. Introduced and discarded, after ministering to Tom's injuries.

Miss Mary Nestor--Betrothed love interest of Tom who lives on the east side of Shopton. Described as a "very pretty young woman with flashing brown eyes, and a sweet trilling laugh." Blushes easily, especially around Tom. In this tale, she is reduced to the role of handkerchief-wringing damsel-in-distress, when Tom disappears for the middle third of the book.

Mr. & Mrs. Newton--Ned's parents. No names or descriptions are given, in spite of important relation to a main character. Walk-on parts in this tale.

Mr. (Amos) Nestor--Mary's father. In spite of major roles in several of these adventures, his description is never given, and his first name was only mentioned in passing, in episodes #1 and #6. Walk-on part in this tale.

Jim Clark--No description given, but is "trusted" and working on a "negative gravity machine." Plays detective in this tale.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. Never fully described, in previous tales he was "portly" with a moustache and "tortoise-shell glasses." Appears to be quite wealthy. He had previously been safely out of travel conveyance trouble, but in this tome, he ends up unable to even steer a power boat after Tom is thrown overboard. We also find out he cannot stand being near onions in any form.

Bill Tagg, the Thin Tramp--No other description except that he was hungry and dirty. Played a pivotal role in rescuing Ned and was rewarded with cash and an airplane ride.

Slattern Sally--No other description except old and disheveled.

Prehensile Pete--Young barefoot farm boy. I envision a young Huck Finn with overalls and a straw hat. All he lacks is a wheat straw stuck in the corner of his mouth & a bamboo fishing pole. Helps Tom find Ned.

Bill the Boatmonger--No other description except rents a motor boat named *Gull* to Tom & Mr. D.

The Terrible Tramp Trio--A rough and burley bunch. Ride in a motor-boat named *The Turtle*. Kidnap first Ned, then Tom. All are armed and presumably dangerous-but how bad can they be if they name their boat after an animated Army helmet???

Torpy--NFN Poppa Bear, Largest of the bunch.

Janner--NFN Momma Bear, Medium sized & brains of the outfit.

Snogg--NFN Baby Bear. Still big & dangerous, though.

All were used and discarded without development. Armed, dangerous and still at large.

Gill Marsh--No description given, except a local fisherman, known by Tom. (I'd have gone one step farther and named him Gill Nett, considering his hobby...)

Joe Corrigan--No description given, except as Shopton policeman. Assumed to be a noncom, as he leads a raid on the bad guys' hideout.

Sinister Sam--No description given, except "furtive stranger." Seems able to come and go at *Swift Construction* without hindrance. Later determined to be Greenbaum. (Above)

Scores of Steamed SCC Shopworkers--"Several hundred" loyal laborers (and one traitor) who man the machinery at Tom's factories. Search for "infernal devices" on the SCC grounds.

Helen Morton--No description. Love interest of Ned Newton first introduced 2 volumes ago. In this tale, we find out Ned is engaged to her. (Well, they have been dating for a year, now. That must have been *some* souvenir he got her, during the *Circling the Globe* episode.)

Mr. & Mrs. Morton--Helen's parents. No names or descriptions are given, in spite of important relationship to what will soon be a main character. Walk-on parts in this tale.

Armed AI--Unidentified and nameless Swift employee, acting as a guard for Tom's lab.

Banker Bob--Unidentified and nameless Shopton Bank President. Possibly Ned's old boss? If so, would be one Isaac Pendergast.

Trio of Negro Servants--Educated of language and cultured in demeanor. (Not like Rad, it is said.) Servants to wealth and gentility. Why three? I don't know, as only one (Richard) was named, and they played no significant part in the story.

The Alphabet Bunch, a Menagerie of Masked Movie Moguls--Six wealthy business executives who think they stand to "lose millions" if Tom's invention is marketed. Only two are named: Mr. X and Mr. B. (The names have been changed to protect the guilty.) They start out wearing black hoods, and are only described in the most general of terms. Mr. X is the ringleader. Mr. B is short, fat and nervous. An unnamed third is a "tall New Englander." The others are faceless nobodies that could have been eliminated from the tale, for all the part they played.

As is usual lately, many of these characters (especially the ones introduced late in the story) do not rate any development or even a description. They are brought forth and discarded after they do their bits to make the story flow.

Major Inventions:

It's **Showtime!!!** This story should be rightfully called *Tom Swift and His Pay-Per-View Big-Screen Color Television*. The title (and dust jacket illustrations) are totally misleading. The Swift Talking Picture Machine has nothing to do with sound motion pictures. Tom's invention is a large flat screen color TV with a pay-per-view attachment to allow viewers "to go to the theater without donning a starched shirt and high collar." Sound is transmitted via radio and the video picture is on a different frequency, as are today's TV signals. No other technical details are revealed, except the viewing plate contains Selenium, a la *Photo Telephone* (See Vol. #17.)

The image is "bright and beautifully colored. It is as clear as any motion picture film." It is shown on a "3 foot square metallized glass plate." That would make it about a 50 inch diagonal screen. Impressive, even by today's standards. Sound is high(er) fidelity, "not blasting, tinny or horn-like." High quality for the day, but obviously not *Dolby Stereo Surround*.

This invention will indeed change life as we know it, forever.

Commentary on Society, Attitudes, Environment & Errata

It's amazing how much technology and society have changed. Shopton, *Swift Construction* and environs remain consistent, but in spite of alarms, guards and electric wires, the bad guys come and go as they please, spying, planting mines and throwing bombs. Most of the literary baggage dragged out in previous

episodes is discarded. We are back to a tale of industrial espionage, kidnapping and intrigue. I wonder what people will be taking for granted 100 years from now, and what they will think of our "modern" society and its' mores (or lack of them...)

Attitudes and Prejudices: Some *clews* (although that term was *not* used) that were detected as to the author of this tale: This tale *reeks* with a string of *coincidences* that are required to allow the story line to progress. The plot also requires *foreboding*, bordering on clairvoyance, to prepare for events that make the story flow. Characters are introduced and discarded with abandon. The author's engineering knowledge is minimal. The look-and-feel of the text is familiar, however. The circumstances & hazards in this tale (kidnapping, guns & bombs, and multiple *hooded* opponents) are very reminiscent of the *Airline Express*. (See Vol. #29) The similarity in writing style and attitudes is, in my judgment, pretty conclusive. Aside, the author may have also had a hand in writing *Nancy Drew*, as stormy nights and an old creepy house with a secret passage play prominent roles in the tale.

Said "dilapidated" house, is located on *Rattlesnake Island* out in *Lake Carlopa*, a mile from shore. Interestingly enough, this ramshackle place has both phone and electric service in working condition.

Tom continues in his use of firearms. He now carries an "automatic" when chasing bad guys and passes out similar pistols to all comers (except Koku) when they pull a private "raid" on a suspected hideout. (The police apparently still can't investigate their way out of a paper sack, so Tom has to go it alone.) There is also some discussion about the physics of being shot at. It is said that you "hear the bullet pass before the gun's report." This is true with supersonic rifle ammunition, fired from a distance. The pistols being used were historically subsonic, and up close. All I know is that when you hear a shot, you *take cover*, rather than standing around discussing acoustics...

It is said that theater tickets ran between \$2 and \$7, and movie tickets were \$0.50. I wonder how much Tom was planning to charge TV owners to see the same material? It was never specified, but "millions" were to be made.

Television certainly did change the world, and some would say not necessarily for the better. Anyone who has seen an episode of *South Park* can attest to that. The jury is still out about *The Simpsons*... (The folks in the 22nd century reading this are either laughing or scratching their heads wondering about the references. I assume the Internet will still be around in 2105 in one form or another...)

Errata: There is a running gag throughout this series. Mr. Damon's home keeps flip-flopping between *Waterfield* and *Waterford*, NY. Sometimes it is in neither, and several times in both places, at once. This is partly due to the enforced poor communication amongst the many ghostwriters at G&D that contributed to this series.

There are now 4 distinct categories. In this tome Mr. D's home **flips** back to **Waterfield**.

The tally for 31 volumes, to date is:

Waterfield-15, Both places-2, Waterford-9, and Neither place-5.

Typos and malapropisms were nonexistent. Either the editing improved or the author's skills did.

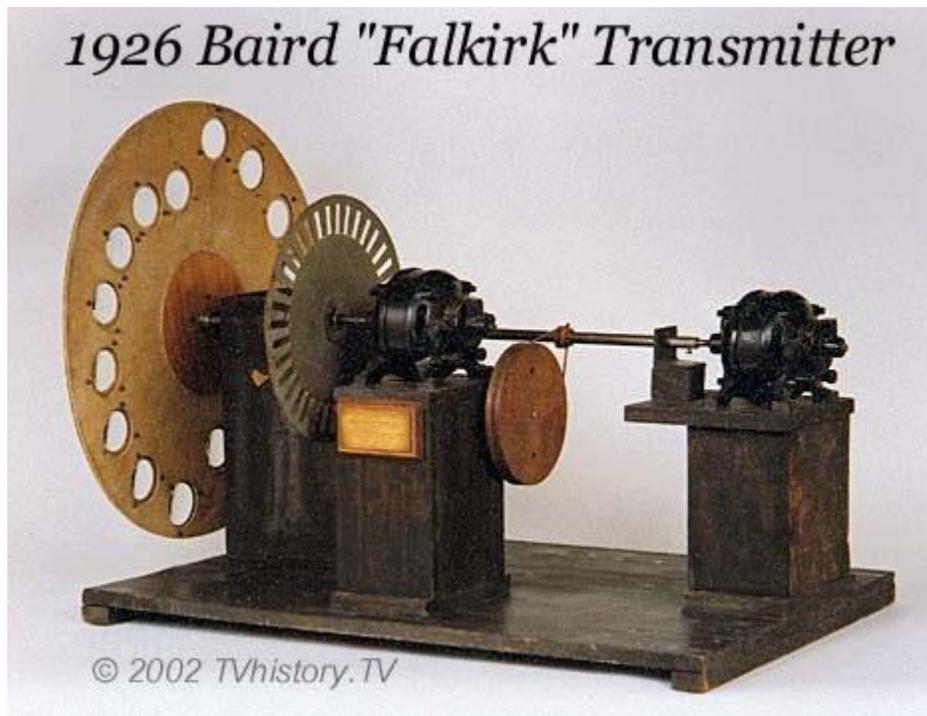
It has previously been *de rigueur* for Tom to "rescue" someone, *anyone*, at least once per episode. In this tome, *he* is the one needing rescue-actually, several times.

Engineering and Science, Fact vs. Fantasy:

On **January 23, 1926**, John Logie Baird (of Scotland) gave the **world's first public demonstration** of a mechanical (black and white) television apparatus to approximately 40 members of the Royal Institution at his laboratory on Frith Street. These were images of living human faces, not outlines or silhouettes, with complete tonal gradations of light and shade.



John Logie Baird



The transmitting apparatus actually used for this 1926 demonstration is believed to be this piece of hardware. The receiver sported a a postcard-sized black and pink (not black and white) image with 30 scan lines running at a flickering 12 1/2 frames per second.

Early Color Television

The article below was published in the British "Journal of The Television Society", in **September 1941**. It not only shows the *first photograph ever taken of a television screen* in 1926, but also gives a glimpse of Baird's experimental 600-line color television system, which includes the **FIRST** photograph of a color television screen ever published.

TELEVISION IN COLOUR

J. L. BAIRD'S NEW ADVANCE

While the theory of television was well-known long before 1926, no practical success had been achieved in transmitting television images. It had only been possible to send shadows of shapes ; in other words, the televised image was then nothing more than a transmitted shadowgraph. On January 27th, 1926, however, for the first time, true living pictures—that is, images modelled by light and shade—were shown by a system of television invented by John Logie Baird, a demonstration being given to members of the Royal Institution and other scientists on that date. This achievement created a sensation which most of us remember, and much appeared in the Press at that time, a good deal of it greatly exaggerated. What was actually shown in that year is simply and authoritatively described in an article by Dr. Alexander Russell, F.R.S. a past president of the I.E.E. and of the Physical Society, writing in "Nature" of 3rd July, 1926. He states :—

" We saw the transmission by television of living human faces, the proper



The first photograph of a television image ever published, the image on the screen of Mr. Baird's first televisor in 1926.



(Miss Paddy Naismith, the well-known Airwoman)

The first photograph of a colour television image ever published, the image on the screen of Mr. Baird's 600 line colour televisor.

What is amazing is that Baird continued to develop this set in private, in spite of the on-going World War at the time.

American color TV began (for real) in 1953. There were startup wars, as several competing systems were being proposed. Most were not compatible with black and white, which meant you needed a separate receiver to watch color programming. RCA's system, which was backward compatible with B&W, was eventually made the standard. I remember when color programming was only offered on one network-NBC-and then only on certain shows. These broadcasts were preceded by the network's multicolored peacock opening his tail in a rainbow of color.) Only the wealthy at the time could afford the TV sets that could display these programs. Those required constant adjustment, as colors would "drift." My family got our first color set (used) in 1964. It was a real treat!



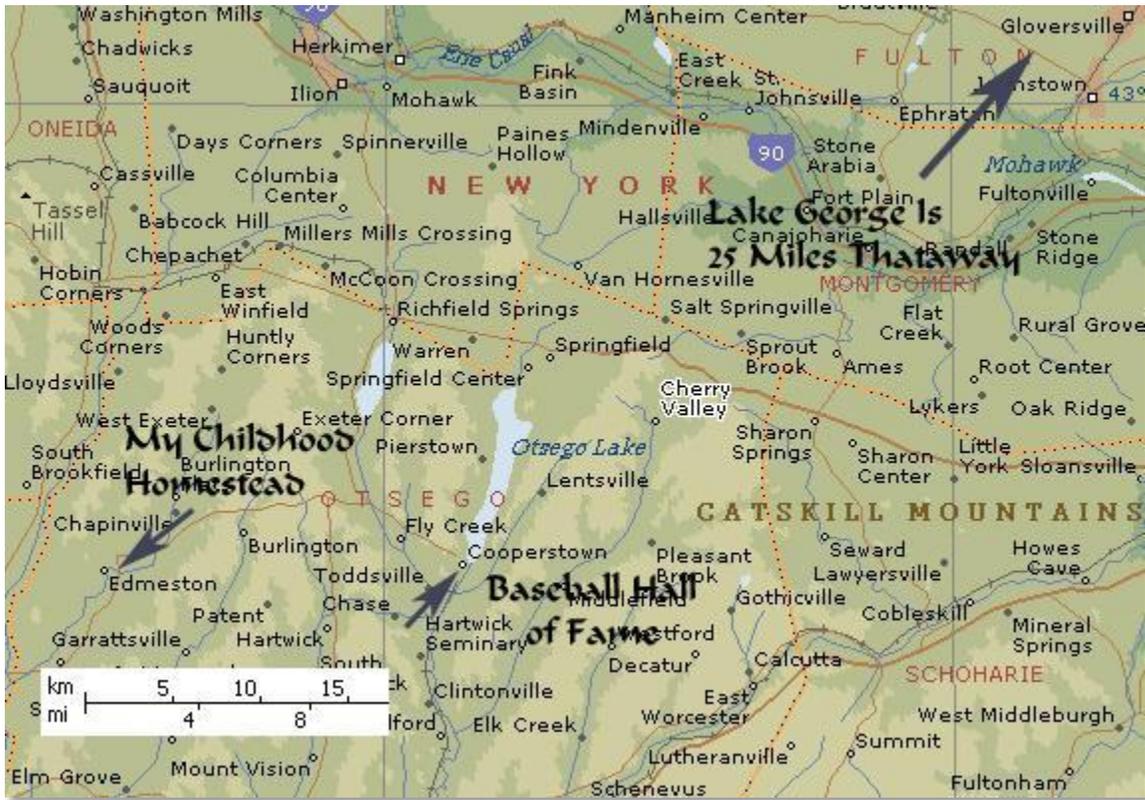
1956-62 NBC "Living Color" Logo

Coincidentally, Tom's idea was prophetic and has come full circle, with "pay-per-view" events quite common. Theater owners are *still* trying to figure out how to get folks to come out and see live performances and movies in theaters.

Geography

The author remains enigmatic about *Shopton*. It is now not specified as to which state it is in, however the local topography is once again expanded and described in more detail. A new landmark, *Rattlesnake Island*, is said to be located in *Lake Carlopa*, north of *Shopton*. It is wild and wooded and contains a large dilapidated house that has secret passage(s) in it. I would suspect it was possibly the ancestral home of Carolyn Keene, of *Nancy Drew* fame, except that late in the story it was said the house was constructed as a movie set.

A place called *Cherry Valley* is said to be located 10 miles east of *Shopton*. This would put it in Vermont, if *Carlopa* were really *Lake George*, as I have previously speculated. Coincidentally, *Cherry Valley* is an actual town in central upstate New York, near where I grew up. It is 10 miles east of *Otsego Lake*, another body of water that would make a great template for *Carlopa*, except for its' size. It is a bit too small, and has no islands or bays.



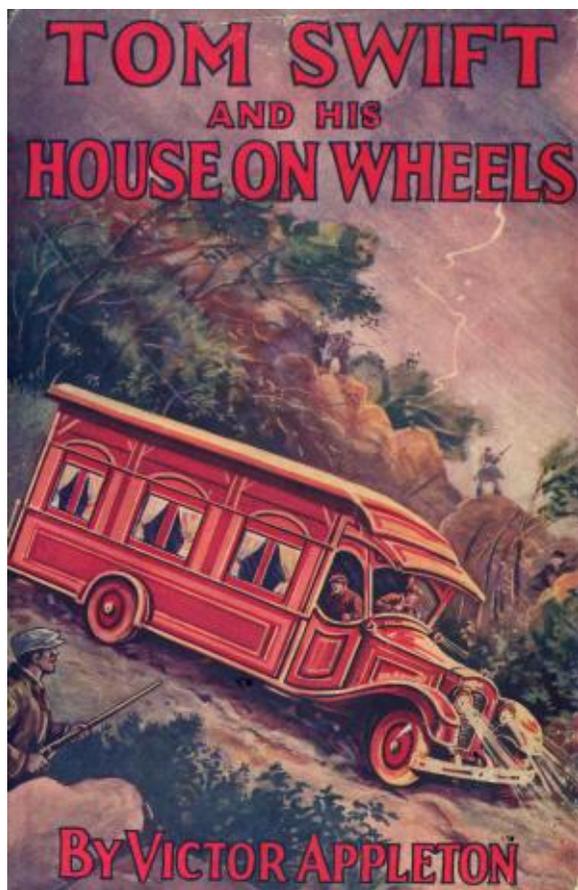
Cherry Valley, NY. Image courtesy Microsoft MapPoint.

JP Karenko 10/15/05

#32. Tom Swift and His House on Wheels (1929)

or, A Trip to the Mountain of Mystery

Review by JP Karenko, October 2005



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

Bells are chiming in the distance. Can't tell exactly what kind, but since Mary Nestor has got Tom looking at furniture, one has a pretty good idea. One also wonders about the future, as *Swift Construction* is not doing all that well. *The AirLine Express* hasn't been the money-maker that it was hoped for, and the *Talking Picture* box has still yet to reach its' stride, income-wise. Tom is offered a lucrative, but suspicious contract to build equipment for a man who is known to have a less than honest reputation. When Tom refuses the deal, this guy goes psychotic and starts threatening mayhem and murder. But, when in doubt, "put on a happy face," as they say. Tom designs and builds an RV motor home that can be used to "get away from it all," (including the psycho, above.) It can also be used for more mundane tasks, such as...honeymoon trips?

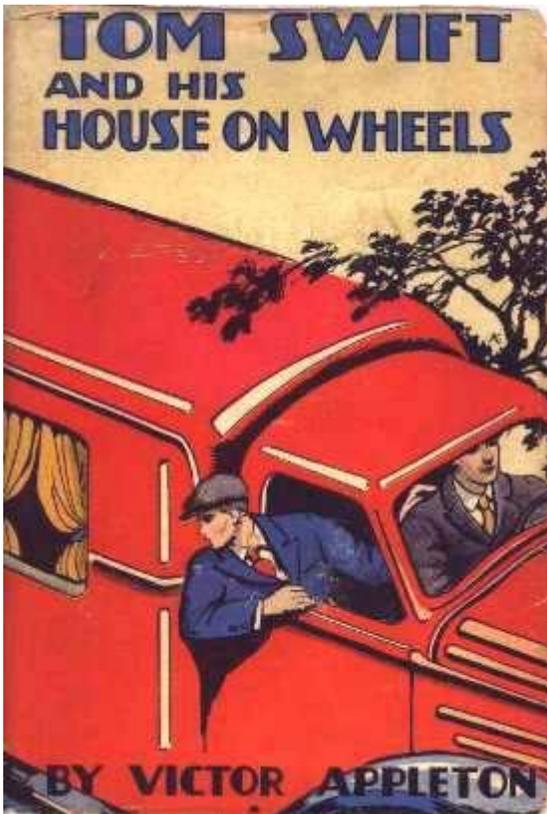
To add to Tom's troubles, Jealousy rears its' ugly green-eyed head. Once again, Tom is called to do battle with another male suitor who takes 'way too much interest in Mary Nestor. The fur is on end, the ears are laid back, and teeth & claws are bared. As almost an aside, there is a local landmark, *Dismal Mountain*, that is rumored to be the hangout of "highwaymen, train robbers and bootleggers." What better place to try out the new road machine, than by driving it through a nest of vipers, so to speak? The test trip turns even more eventful, when Tom & Ned get carjacked, not once, but *twice*.

Nefarious activities abound and gunfire erupts. Tom survives, but how these problems are resolved, you will have to locate a hard cover copy of the book to find out.

Cast of Characters (More or less in order of appearance)

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical

Basil Cunningham--Angry, blustery and obnoxious Englishman. Suspected of engaging in patent infringements, he becomes psychotically angry when Tom refuses a business deal. The machinery he wants built could be used to make contraband merchandise.



Barton "Bart" Swift--On the dust jacket of *Chest of Secrets*, his appearance is remarkably like that of Robert E. Lee, but with glasses. Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. In this episode, he is back to an active part "in certain matters" at *Swift Construction Co. (SCC)*.

Mr. Swift, has once again declined in his health, and is now being attended almost full-time by Eradicate Sampson.

Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited cognitive facilities. Described as "savage and only half-tame," he is antagonist and rival of Eradicate. In this episode, he picks up a 200lb table "with one finger." He continues as watchman & guard at SCC and his other chore of antagonizing Rad.

Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro manservant. He is now going deaf and is described as "aged, decrepit, wizened and shuffling." He remains faithful to Tom and helps out where he can. Constant rival and antagonist of giant Koku. In this tale, he is personal attendant to Barton Swift and said to have cared for race horses in Virginia, in an earlier time.

Ned Newton--Chum & companion of Tom. His description is never given. He continues in his position as Swifts' financial advisor and CFO (Treasurer) of *Swift Construction Company*. In this tale, he continues residing at the Swift manse.

Garrett Jackson--No description given, but is spry and fit for his age. (Volumes written 15 years previously, described him as an "aged Engineer.") He is now *Swift Construction Shop Manager/Superintendent*.

The Ricky Rat Club--Two co-conspirators, allied with Basil Cunningham, who engage in sabotage and mayhem. One is only described as "rat-faced." The other is not described. Neither is ever identified or named.

Miss Mary Nestor--Betrothed love interest of Tom who lives on the east side of Shopton. Described as a "very pretty young woman with flashing brown eyes, and a sweet trilling laugh." Blushes easily, especially around Tom. In this tale, she goes to the big city to visit rich relatives, the Winthrop family. Tom is concerned she won't want to stay "down on the farm" in Shopton after sampling the delights of "The Great White Way."

Mrs. (Amos) Nestor--Mary's mother. In spite of roles in several of these adventures, her description is never given, and her first name is never mentioned, even in passing. Walk-on part in this tale.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. Never fully described, in previous tales he was "portly" with a moustache and "tortoise-shell glasses." Appears to be quite wealthy. He has an ongoing problem with travel conveyance trouble. In this tome, he ends up on foot after his automobile breaks down on a lonely road.

Unnamed SCC Mechanic--Cleans up Tom's auto after he "rides it hard and puts it away wet."

Grace Winthrop--Cousin of Mary Nestor. Not old fashioned & conservative, like her relatives, who "date back to the Massachusetts Bay Colony." Social butterfly and bad influence on Mary.

Floyd Barton--Playboy drone. Representative of the New Money In Town. Known to be a "good dancer" and a 1920's style party animal. Takes an unhealthy (for him) interest in Mary Nestor.

Tim, The Traveling Tramp--Faceless, dirty, smelly, disheveled and hungry. Brings a warning to Tom & Ned to stay away from *Dismal Mountain*.

Gary The Guard Guy and Bruce The Bat-Boy--Faceless & nameless local urchins who guard the House on Wheels (HoW) when Tom and Ned go grab a meal in a local beanery.

Village Vic and His Country Cronies--Local residents of a small unnamed village. Warn Tom & Ned not to go up *Mt. Dismal*, but give directions anyway, when pressed.

Crowd of Cranky Carnappers--These guys put the "dismal" in *Dismal Mountain*. Never completely described, named or enumerated. Their total numbers are from "two" to "many." All go armed and are a mixture of thugs, burglars, highwaymen, train robbers, and bootleggers.

Boss--Later identified as Basil Cunningham (above.)

Big--Part of a Mutt 'n Jeff combo, he is the brains of the duo. No name given.

Small--Short squat, ugly, and not too bright, but has "street smarts." Named Gorro.

Jerkin--No description, but carries a rifle and has a propensity to shoot people.

D&D Dan--Generic thug. Principal characteristic is that he spends a lot of time drunk. His incompetence allows Tom & Ned to make an escape. I suspect his current resting place is a shallow grave in the deep woods...

Eyes and Ears--Floyd Barton (see above) acts as finance and liaison with the business world. He is the gang's "front man."

Sergeant Sleepy Sam--Local constable who wakes up fast when Tom & Ned come to the station with their tale of stirring the hornets' nest on *Dismal Mountain*.

Handyman Hank--Winthrop Estate gardener. Greets Tom & Ned after the great escape. No name or description. Bit part.

Gay Gus--In this case 'gay' is defined as "happy and dressed in a 'violently colored' sweater," rather than the current reference to sexual orientation, but y'never know.... No name or other description. One of a bunch of sycophant party-goers on Floyd Barton's houseboat.

Aunt Mary Winthrop--Dowager chaperone at the houseboat party. Bit part.

Dock Man Dave--Burley deckhand, who turns out to be a "special officer" with arrest powers. Puts the arm (and cuffs) on Floyd Barton, when he resists apprehension.

Helen Morton--No description. Love interest of Ned Newton first introduced 3 volumes ago. She is engaged to Ned. (Well, they have been dating for over a year, now.) She is already making noises about her own wedding plans, much to Ned's dismay.

Mrs. Baggert--Majordomo & housekeeper of the Swift Manse. In charge of "several" maids. Mother figure, she loves Tom like a son. Sheds the obligatory tears at Tom & Mary's wedding ceremony.

Parson Pete and the Wonderful Wedding Witnesses--Not specifically mentioned, but this was a church wedding and everybody who was anybody must have been there. (Can you imagine Koku in a tuxedo???)

As is usual lately, many of these characters (especially the ones introduced late in the story) do not rate any development or even a description. They are brought forth and discarded after they do their bits to make the story flow. The (hopefully humorous) alliterative names are my "inventions" to make reading these reviews a bit more fun.

Major Inventions:

The *House on Wheels (HoW)* is a precursor to the classic Winnebago. Variousy described as "similar to a circus wagon" or a "canal boat," it is a large, self-powered mobile home/recreational vehicle. It is of wood construction and "gaily painted" with shutters on the windows. It sports a clerestory roof, if the illustrations on the dust jacket and frontispiece are to be believed. The "house" part is mounted on a heavy-duty truck chassis, with "grooved, non-skid tires." Power is provided by a V12 engine, presumably to the rear wheels only. The transmission is manual with at least 3 forward speeds. Top speed on smooth and level road is in excess of 80 mph, and a sustained cruise speed of 50 mph is expected. It has high ground clearance, giving it a limited off-road capability. Weight is in the 4000lb+ range, and the running gear sports electric headlamps, starter motor and windshield wipers. The living area consists of 4 "rooms" and includes a galley, living room, 2 bed rooms and entrances front and rear. More details, below.

Commentary on Society, Attitudes, Environment & Errata

Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted. It also has given me a grasp of just how technologically and culturally unsophisticated the average reader was in the early 1900's.

Attitudes and Prejudices: Some *clews* (although that term is no longer used) that were detected as to the author of this tale: This tale reeks with a string of *coincidences* that are required to allow the story line to progress. The story also requires significant *foreboding*, (bordering on clairvoyance,) to prepare for events that make the plot flow. Characters are introduced and discarded with abandon, many not named or described. The author's engineering knowledge is minimal. The look-and-feel of the text remains familiar. The circumstances & hazards in this tale (spooky houses, stormy nights, and multiple opponents-one *hooded*) are very reminiscent of the *Talking Pictures, AirLine Express, and Television Detector*. Language remains a mix of modern slang and older English. The author discovered the word "laconic," and uses it to describe Tom several times. The words "piazza" and "dingus" are also reused many times. The similarity in writing style and attitudes is, in my judgment, pretty conclusive. I feel that Harriet Stratemeyer is firmly planted behind the typewriter for this one, at least as editor.

Engagement (to be married) seems to be a fluid sort of commitment in these stories. Mary seems to have somewhat of a roving eye, hanging out with Floyd Barton, in this tale. This causes Tom no end of heartburn (physical and mental) and seems to make light of the commitment to exclusivity that serious companionship and "engagement" implies, at least nowadays. Also it is interesting, that while Tom & Mary have been "engaged" for at least the last dozen or so books, he just now gets around to finally asking Mary to marry him. I was under the impression that a commitment to marry was what "engagement" was all about.

On that note, Tom once again displays an almost psychopathic rage and desire for revenge, when he hears that Mary is in the company of another potential suitor. Perhaps there is a bit of feline in the Swift genes? Tom behaves with all the restraint of a tom-cat defending his territory. Mary, on the other hand, seems content to sit on the sidelines and watch the fur fly, as any good queen in the feline world would do. This marriage could become "*interesting*" as in the Chinese curse: "*May you live in interesting times...*"

Speaking of our All-American Hero's other fine qualities, his judgment stinks. He goes into a lonely area with a known bad reputation and inhabited by an unknown number of armed and dangerous felons, apparently *for the sport of it*. He figures such activity will be "stimulating and keep him from going stale." (Ya think?) He gets carjacked, not once but *twice*, kidnapped, imprisoned and shot at. Stale, indeed! Stale, moldering and resting in an unmarked grave... Mary needs to make sure his insurance is paid up...

Tom continues in his use of firearms for personal protection. He and Ned both carry small "pocket sized automatics" (probably .25 or .32 ACP caliber) when chasing bad guys. Those pistols actually get used, but only as noisemakers. Even in a fire fight, Tom won't aim to hit anybody. On the other hand, if they are "savage tribesmen," then, it's open season. The *need* for personal protection? Times are getting tough. It is said that the (lonely) road to Mary's house has had "many robberies" and "highwaymen" using it to ply their trades. The inhabitants of *Dismal Mountain*, are said to be "highwaymen, bootleggers, and train robbers"ñand I suspect there are probably lions and tigers and bears, too. (*Oh my!*) All of the bad guys seem to be "armed and dangerous," and ready to commit capital crimes. Tom's world isn't all that idyllic, any more.

The police apparently have suddenly become a bit more effective (or, at least New York State Troopers are.) Tom no longer has to "go it alone," while apprehending the crooks. A dragnet is laid and the bad guys are all scooped up when they bolt from their mountain hideout. Why the cops let all this stuff go on and

did nothing until Tom stirs the pot, is a mystery to me. Maybe they just waited for a bird dog like Our Hero to flush their game out of hiding for them?

Tom & Mary are hitched at the Union Church in Shopton. It's been a while since any spiritual references have been made in these tales. Perhaps Tom is one of those Christmas and Easter church members? Union was probably a Presbyterian Church as that was the nominal faith of the Stratemeyer family.

Errata: There is a running gag throughout this series. Mr. Damon's home keeps flip-flopping between *Waterfield* and *Waterford*, NY. Sometimes it is in neither, and several times in both places, at once. This is partly due to the enforced poor communication amongst the many ghostwriters at G&D that contributed to this series.

There are now 4 distinct categories. In this tome Mr. D's home *is not mentioned*.

The tally for 32 volumes, to date is:

***Waterfield*-15, *Both places*-2, *Waterford*-9, and *Neither place*-6.**

Typos and malapropisms were almost nonexistent. P17 has "...that *it* (is) at the rear and p73 describes the *fastness* (vastness) of the forest.

It has previously been *de rigueur* for Tom to "rescue" someone, *anyone*, at least once per episode. In this tome, he picks up a stranded Mr. Damon. Later, *he* is the one needing rescue-actually, several times. After he gets carjacked a second time, you wonder if he is a slow learner...

Back to guns & such, Tom starts this tale carrying a revolver, but later his "carry piece" is a small automatic. Given that he could own several, most folks stick to one or the other

Engineering and Science, Fact vs. Fantasy: Anyone who is familiar with a device called the "*Tardis*" from *Dr. Who*, knows about the "*contents of this contrivance are much more spacious than is physically possible*" law of fiction writing. The interior of the *HoW*, from the rear entrance forward, consists of 4+ "rooms." Rear entry is via fold away stairs, "so children cannot hitch-hike," (Hanging on the exterior of a trolley was a popular way of avoiding the five cent fare of the day. That nickel could then be used to see a matinee movie. My father told me he did such things as a child. It's no wonder my grandmother beat him...) As you enter from the rear, first is a galley with electric stove, icebox and pantry. Moving forward, there is a dining/living area with table and chairs. Then, 2 bed rooms, port and starboard. Each of these can sleep two, presumably in bunks. (I'd have made at least one a double, as this was to be Tom & Mary's "Love Shack" during their honeymoon...) Then, there is a "vestibule" front entrance that goes to the driver's area. Somewhere in there, a bathroom/toilet is also hidden. Pretty plush!

Running gear is via manual transmission from a V12 gasoline motor, driving "special grooved non-skid tires." Speaking of those tires, running this behemoth at speeds approaching 100mph on the Model T style tube tires of the day borders on suicidal. Today's radials can be driven safely at high speeds, but even their precursors, the bias-ply glass belted tires of the 60's and 70's were subject to blowouts at 100mph speeds.

Anyone who has seen movies of tire deflection at high speeds, (I have) wonders how they stay together for any length of time. One good pot hole and... Well, maybe Tom was just ignorant. Much is made of his judgment <sic>and driving skill.

Initially, it is said the V12 drives a "dynamo" to "provide current for the electric stove *and motors*." Nothing further is ever said about an electric propulsion drive, so I presume that the author was just copying old habits and making every contrivance Tom builds an electric or a hybrid. When racing a freight train at speeds approaching 100mph, the only concern was for damaging the V12 motor, as it is not "broken in."

There isn't a lot of real engineering in this "invention," other than cramming all those luxury features into a mere 4000lb vehicle. We are talking large, gaily varnished/painted wood construction with "shutters on the windows" a la circus wagon. My original 1970's "pop-up" camper had a wood frame, was much smaller and had a lot less in the way of luxury features than Tom's RV. With no cab, chassis, motor or running gear, it weighed almost 1800lb, empty. Tom must have built his out of Balsa wood.

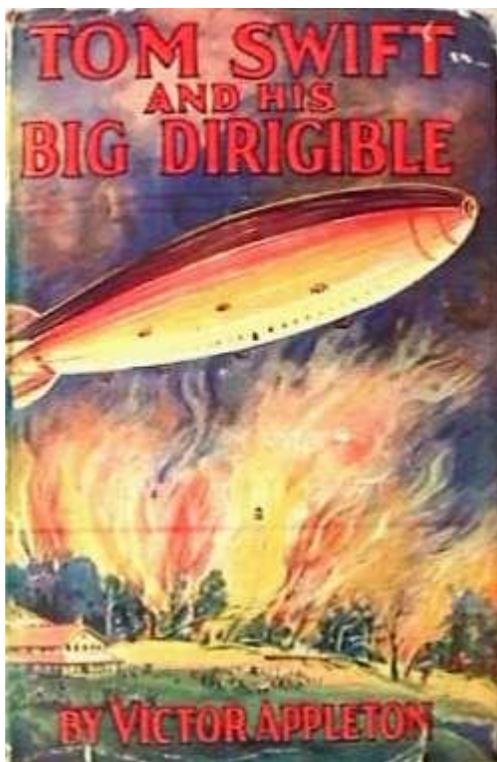
Geography: The author remains enigmatic about *Shopton*. It is still not specified as to which state it is in, however the local topography is once again expanded and described in more detail. A new city, *Chesterport*, is said to be located near Shopton, in "this state." Previous volumes specify "*this state*" as New York. State highways are now smooth, flat and paved with concrete.

Dismal Mountain, the "Peak of Mystery," is said to be about 100 miles away from Shopton. If, as is presumed, *Shopton/Carlopa* are actually modeled on *Lake George NY*, the peak would be in the Catskill Mountains. Nearby *Chesterport* would then be on the Hudson River.

JP Karenko, 10/26/05

#33. Tom Swift and his Big Dirigible (1930) (Review 1)

(The top image is of the dustjacket found on the Grosset & Dunlap editions. The lower image is of the dustjacket that can be found on the later Whitman reprints of this title.)



"Yes, it must be the biggest dirigible ever built!" exclaimed Martin Jardine. "And you must build it, Tom Swift!" So the newlywed Tom Swift launches into his next big adventure: the construction of the *Silver Cloud*, a blimp over 1000 feet long and the largest in the world at its time. Equipped with 50 passengers and a crew of 40, the gigantic blimp was to have a range of 10,000 miles.

All went well for a while, but the deal turned sour when it was discovered that Martin Jardine did not have the authority to enter his company into contract with Tom -- and his older brother Lawrence, who *does* have authority, refuses to make good on the deal.

Stuck with thousands of dollars of losses and a half-completed blimp, Tom decides to complete the blimp himself, hoping to sell it to the government or a private concern after it is completed. When Tom completes the blimp, it proves a smashing success -- capable of bucking even a hurricane-force gale -- but no one wants to buy it!

The book comes to a climax when a madman sets a ring of fire around a resort on Mount Camon -- the very resort where Mary Swift, Mr. Damon and the ailing Barton Swift are staying on vacation. Tom Swift must use his dirigible in a desperate race against time before his family and friends are killed in the blaze!

The Cast of Characters

Before I launch into a discussion of the invention featured in this book, I thought I'd stop to say a few words about some of the characters involved -- without, hopefully, ruining the story for those who haven't had a chance to read it yet. I normally wouldn't do this, but the characters struck me as being so amusing that I thought I'd stop and say a few words about them.



All of the old familiar characters, of course, either appear in the book or are mentioned. **Koku**, the giant with the fantastic strength, is still here and helps Tom build his colossal ship -- although he spends his time fighting with a dwarf instead of with Eradicate, which is kind of disappointing. **Eradicate** is here, although he has aged very much and is too feeble to go along on the daring rescue. **Ned Newton**, the faithful financial manager, is still at Tom's side, and still provides Tom with good practical advice -- which Tom continues to ignore.

Barton Swift (Tom Swift's father) appears in the story as an aging man who is failing fast. It was known as long ago as Tom Swift and His Air Glider that he was in ill health, and it appears his health has only grown worse. "*Great projects did not interest him as they once had done*", the first page of the book tells us, and during the story he had a bad blackout spell while simply working out some mathematical problems. Tom sent

him to the mountains to build up his health -- which is how he happened to be at Mount Camon when the insane gardener set fire to the mansion.

Mr. and Mrs. Nestor make appearances as guests at the same resort where Barton and Mary Swift are staying. They appear to be in fine health, albeit they have aged over the years. **Tom Swift** would have been at the resort as well had he not been called away on dirigible business.

Mr. Damon is also -- by coincidence -- staying that the same resort. He hasn't changed a bit throughout the years, as the following scene testifies:

"Bless my watering can, but those are the finest roses I ever saw! I must have one!"

He reached over to pick a blossom...As he did so, the man beside him, with a cry like that of a wild animal, shouted:

"No! You must not! I forbid you!"

"My man, you forget yourself!" said Mr. Damon severely. "I have been a guest here before and I know it is allowed to pick a few flowers. Stand aside!"...

"No! No! You must not pick that rose!" cried the man, and he raised his hand as if to strike Mr. Damon. But that eccentric character was very quick, and a moment later the gardener went flying backward into some bushes, propelled by the vigorous fist of Wakefield Damon.

"There!" exclaimed Mr. Damon with a grunt of satisfaction, as he straightened up. "Bless my golf clubs, but I think I've taught that insolent fellow a lesson!"

Insolent fellow indeed! When was the last time you heard an insult like that? Least you feel sorry for the poor chap who was hit by Mr. Damon's "vigorous fist," the man (who was the head gardener at the Mount Camon Resort) later turned out to be a true maniac. He had a lot to say about flowers, for instance:

"They are my roses!" snapped the man, and one could see that he had a passionate love of flowers. "No one must pick them! Why should they not live out their lives on their own stems? To pick them is to kill them. Let them live their allotted lives."

When the hotel manager disagreed with him, the enraged **gardener** chased him around the hotel with a knife, shouting that *"No one shall kill my roses and live!"* The gardener was caught and put in jail, but later escaped, stole a gasoline truck, poured gasoline in a huge ring around the resort, and set it ablaze as an act of revenge against the hotel. He was unable to escape his own blaze, however, and perished in the flames.

The mad gardener wasn't the book's only odd character. **Martin Jardine** had some eccentricities of his own. The book describes him as being a "fussy little business man," and indeed he was: he seemed to spend every minute of his free time micromanaging Tom's business affairs. Martin smoked big black cigars (described by Tom as being *"particularly deadly, if you'll excuse my saying so"*) which he was always trying to give away. Tom kept telling him that he didn't smoke, but that didn't stop Martin from offering him and his father one about five times during the course of the book.

Martin seemed -- well, he seemed a bit insane. One day he insisted that Tom take out the weather observation tower in his blimp and replace it with a deluxe private cabin for him and his friends; the next day he had forgotten all about the idea and insisted that Tom carry on as planned. He seemed constantly nervous, incapable of remembering that Tom didn't smoke, and willing to be unscrupulous if possible. Some of his conversations were hilarious:

"Well, I'll think about it," said Tom, once more reaching for some blue prints. "But I must also take my wife on a vacation."

"Tom hasn't been married long," observed old Mr. Swift, smiling.

"Congratulations," murmured Mr. Jardine. "It's a big contract, I know."

"Do you mean marriage?" asked Tom, with a smile.

"No, I'm speaking of this big dirigible. When can you let me know [if you can build it]?"

Finally, the last page of the book gives a big surprise: Ned Newton and **Helen Morton** are said to be engaged. Unlike Tom Swift, however, Ned never seems to get married: the later books have no mention of the engagement, and no ceremony ever takes place. The Tom Swift Jr. series mentions a Mrs. Newton, but never gives her name -- and thus we never know if Ned married Helen or not.

The Dirigible

The main invention in this book is, of course, Tom's Big Dirigible, the *Silver Cloud*. The author claims that at 1,000 feet long it was the largest blimp in existence at that time -- which, of course, is why the Jardine company wanted Tom to build it. "*It's the most scientifically constructed dirigible I ever built*" is how Tom put it, and while no other dirigibles built by Tom are described in the series, I am willing to take his word for it.

The specifications of the blimp were fairly impressive. Mr. Jardine wanted a blimp that could travel 10,000 miles on a single stretch with a full load of fifty passengers, plus a crew of forty. The gas bag portion of the blimp was to be made out of *oralum* -- a special metal stronger and lighter than duraluminum which was manufactured only by Mr. Jardine's company. Oralum, in fact, was the entire reason behind the contract: the *Silver Cloud* was to serve as a gigantic advertisement for the strength and lightness of the Jardine's new alloy.

The blimp was christened the *Silver Cloud* by Tom Swift because the blimp with its all-metal gas bag resembled a "*silver mass of vapor in a blue sky*." Several flat, wave-shaped fins protruding from the sides of the gas bag at its widest point kept it on a steady keel. While Tom never flew the blimp faster than 160 mph, the top speed of the blimp was estimated to be at about 200 mph.

The big problem as he saw it was not the technical issues but the construction: fitting the huge blimp together was going to be no easy task. Because Martin Jardine wanted the blimp to be completed as soon as possible, Tom didn't make all of the engines and accessories himself at the plant -- his firm simply didn't have the capacity to build every nut and bolt and still assemble the dirigible on time. Instead, Tom had certain machines constructed by other firms -- which caused some difficulty when the parts didn't arrive in time and when the firm sent the wrong part.

Here is how the book described the blimp:

Briefly, it may be said that while the generally familiar cigar-shaped envelope to hold the lifting gas was the design followed, there were some radical departures in construction. The stabilizing fins, for one item, were a novelty.

Instead of having the powerful motors suspended in more or less unstable gondolas protruding from and beneath the oralum frame and envelope, the driving apparatus was within the outer skin. Only the powerful propellers, six in all, were exposed, Each motor was accessible from the interior of the oralum envelope.

Within the metal envelope were the quarters for the crew and accommodations for passengers. The latter were forward, and were to be, in miniature, as elaborate as the living quarters on a palatial ocean liner.

The gasoline and oil for the motors, the stores of food and water that would be needed on a ten-thousand-mile voyage, and tools and space parts for use in an emergency, were to be carried near the quarters for the crew and officers.

The greater part of the oralum envelope, of course, was filled with a new and powerful lifting gas, perfected by Tom Swift and his father. It was not as explosive as nitrogen, but

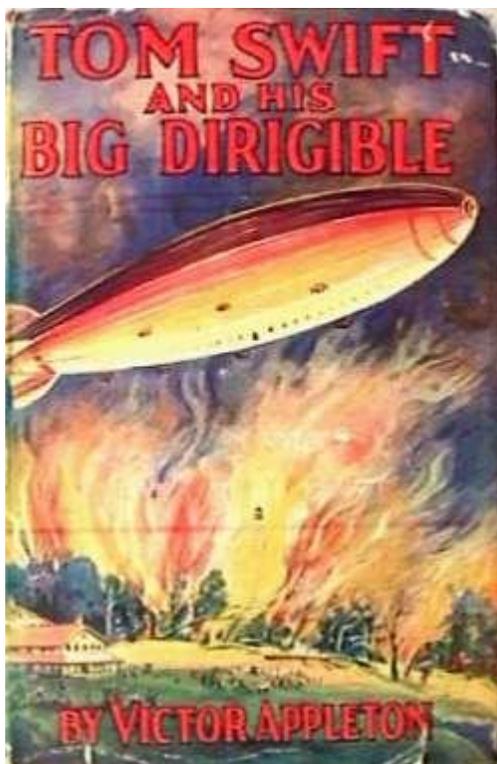
not quite as safe as helium. However, it was easier and cheaper to make. One reason that Martin Jardine had come to them to build his giant dirigible, was because the Swifts held the secret of this gas. The craft was to be built on a cost-plus basis and would be the property of the Jardine company when finished, though of course much credit would accrue to Tom Swift for his work on it.

Unlike many of Tom's other inventions, Tom didn't have any technical trouble inventing his dirigible. In many of the other books (such as Tom Swift and his Wireless Message), Tom gets into fantastic trouble while trying to perfect one of his inventions -- it's almost a Swift tradition. This time, though, the construction of the blimp goes so well that Tom can afford to take a few days off to be with his new wife at the Mount Camon resort. Perhaps at long last Tom Swift's luck had turned! It didn't last, though: Tom's Sky Train was fraught with problems -- one of which caused his plane to crash into the all-glass greenhouse of a particularly fussy character...

#33. Tom Swift and His Big Dirigible (1930) (Review 2)

or, Adventures Over the Forest Fire

Review by JP Karenko, October 2005



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

The 775ft long *Graf Zeppelin* Just Isn't **Big** Enough! Tom is approached by a cigar-smoking big-wig who wants him to build a *really* Big Dirigible (*Big D*). "The biggest one ever built." It is to be 1000 feet long and carry at least 50 passengers at 100 mph for 10,000 miles without stopping. This is going to be one *big* project. Can *Swift Construction* handle the job, you ask? Pish-tosh! Of course they can, and in six months time-or less!

Design and construction proceed on schedule, until Martin Jardine, the cigar smoking bigwig that signs the checks, decides to start making engineering changes to the nearly completed airship. His inexpert "help" threatens to sink this aerial *Titanic*, with only a large hole in Tom's bank account to show for it. There are further causes for concern, when Tom finds out that Martin was never authorized to build the ship in the first place.

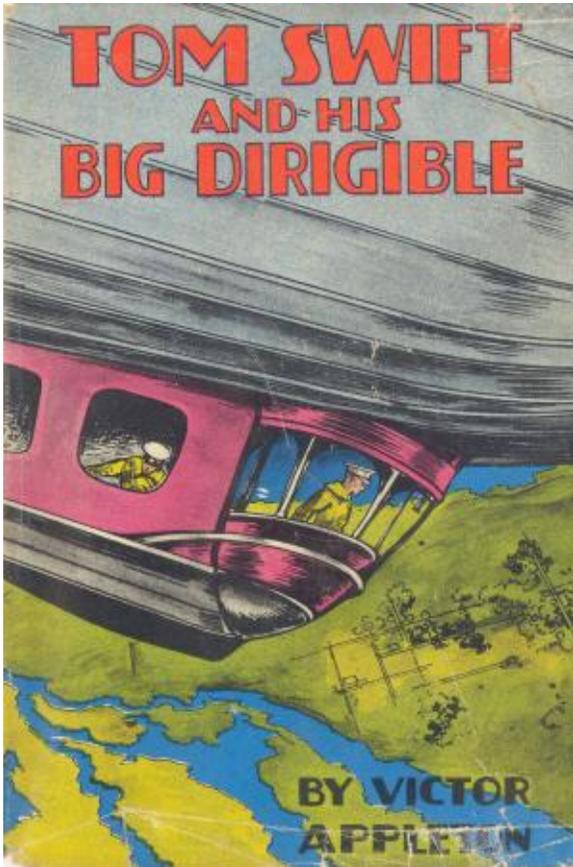
To add injury to insult, Tom's entire family is threatened by a raging forest fire encircling a mountaintop vacation resort where they have gone to escape the oppressive heat of Summer. Only the *Big D* can save them!

Everyone survives, but how these problems are resolved, you will have to locate a hard cover copy of the book to find out.

Cast of Characters (More or less in order of appearance)

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. Now described as "in his early twenties," and a baseball player.

Martin "Marty" Jardine--Short, stout, fussy and nervous, with brown hair. Snappy dresser in a grey suit and tan shoes. Chain-smokes "deadly" black cigars.



Barton "Bart" Swift--Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. Resembles Robert E. Lee, but with glasses. In this episode, he is "in the twilight of his life" and has once again declined in his health. He has become forgetful, repeats himself and becomes faint and dizzy from Summer heat.

Mrs. Mary Nestor Swift--Radiant bride of Tom who now resides with Tom in a wing of the Swift Mansion. Described as a "very pretty young woman with flashing brown eyes, and a sweet trilling laugh." In this tale, we find her birthday is April 2nd and that she loves fireworks. She goes on holiday to a Catskill resort with her relatives and gets more fireworks than even she can enjoy.

Ned Newton--Chum & companion of Tom. His description is never given. He continues in his position as Swifts' financial advisor and CFO (Treasurer) of *Swift Construction Company*. In this tale, he advises Tom against dealing with Jardine, but is ignored.

Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited cognitive facilities. Described as "savage and only half-tame," he is antagonist and rival of Eradicate. In this episode, he continues as watchman & guard at *SCC*. His other chore is

antagonizing Rad.

Garrett Jackson--No description given, but is spry and fit for his age. (Volumes written 15 years previously, described him as an "aged Engineer.") He is now *Swift Construction Shop Manager/Superintendent*.

Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro manservant. He is now going deaf and is described as "aged, decrepit, wizened and shuffling." He remains faithful to the Swift family. In this tale, he is limited to being personal attendant to Barton Swift. His deceased mule Boomerang is fondly mentioned in passing.

Dr. Potter--No relation to Harry. He is not described. Most medical people are never identified or named in these stories.

Mr. and Mrs. (Amos) Nestor--Mary's parents. In spite of roles in several of these adventures, their descriptions are never given. Their first names are not mentioned, even in passing. Walk-on parts in this tale.

James (Call me Jim) Chock--Evil dwarf, in cahoots with Martin Jardine. Short, surly, ugly, vindictive, drunkard (nice guy, huh?) & prone to playing with matches. He has mechanical skills and knows his way around dirigibles. Also "waddles" a lot and can talk himself out some amazingly tight situations that would land ordinary folks in jail.

Kelly--NLN or description. Random faceless SCC employee. Walk-on part.

Pietro & Maria Notine--Traveling Italian puppeteers. Semi-strange show people who set off a panic when they call their marionettes "children" after a car wreck and say they are all "killed." No descriptions, but warn Tom to stay away from Chock.

Bell Boy Bob--Random faceless hotel employee. Walk-on part to deliver a telegram.

Engineer Ed- Random faceless state highway employee. Helps Tom & family after a slide-n-ride down the side of a hill due to a landslide.

Mr. Thorndyke--NFN. Manager of Hotel Camon. No description except, "portly."

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. Never fully described. In previous tales, he was "portly" with a moustache and "tortoise-shell glasses." Appears to be quite wealthy. In this tome, he runs afoul of the Raving Rose Ranger, below.

Cosso Tobini--Maniac gardener and handyman at Hotel Camon. Psychotic who puts the "lives" of his rose bushes ahead of humans. Founder of People for the Excellent Treatment of Rosebushes. (PETER) Gets in a fistfight with Mr. Damon over a picked posy.

Mrs. Lawrence Jardine--Sister-in-law of Martin Jardine. She is "well dressed, genteel and sports many diamonds." She warns Tom against dealings with Martin, above.

Mr. Lawrence "Larry" Jardine--No physical description given. Older brother of Martin, he is a hard-headed businessman, and explorer for oil and minerals.

Kirby Larsen--Faceless USG Meteorologist who is employed to keep *Silver Cloud* out of bad weather. Goes righteously bananas, when Tom drives the *Big D* into a "hurricane."

School of Shopton Sycophants--Faceless & nameless local *boi-polloi* who along with the "executives" at *SCC*, cadge a free ride on the *Big D*, when Tom and Ned go on an exhibition flight.

Ollie the Oil Man--Petroleum delivery truck driver, who gets hijacked while driving up Mt. Camon.

Fred the Fire Warden and the Wonderful Water Wielding Workers--Faceless and nameless local folks who put out a major forest fire with only grit and hand tools. (And maybe a bulldozer or three.)

As is usual lately, many of these characters (especially the ones introduced late in the story) do not rate any development or even a description. They are brought forth and discarded after they do their bits to make the story flow. The (hopefully humorous) alliterative names are my "inventions" to make reading these reviews a bit more fun.

Major Inventions

The *Silver Cloud* continues the Swift Tradition of building machines that are Bigger Faster and More Luxurious Than Anything Out There, usually by a factor of 130-150%

Sporting a 1000ft long, rigid (not fabric) external shell made of Oralumô metal plates, and six internally mounted gasoline powered engines, the *Silver Cloud* is said to carry 50+ passengers at a100mph cruising speed for up to 10,000 miles. Capable of 200mph in short bursts, the ship achieves this quantum speed increase by having no external gondolas or other drag-inducing structures hanging "out in the breeze." It also sports a nose "fender" that allows minor collisions to be shrugged off without damage to the airframe. Accommodations are palatially luxurious.

Lift is supplied by a Swift developed lighter than air gas that is "not as explosive as Nitrogen," (see Errata) and is "cheaper than Helium." I call it SwiftLift.

Commentary on Society, Attitudes, Environment & Errata

Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted. It also has given me a grasp of just how technologically and culturally unsophisticated the average reader was in the early 1900's.

Who Wrote This Book? Some *clams* (although that term is no longer used) that were "detected" as to the author of this tale: This tale reeks with a string of *coincidences* that are required to allow the story line to progress. The story also requires significant *foreboding*, (bordering on clairvoyance,) to prepare for events that make the plot flow. Characters are introduced and discarded with abandon, many not named or described. The author's engineering knowledge is minimal. The look-and-feel of the text remains familiar. The circumstances & hazards in this tale (reckless behavior and localized hurricanes) are very reminiscent of other recent tales. Language remains a mix of modern slang and older English. The author discovered the word "veranda," and uses it several times, instead of the former "piazza." The words "ejaculate" and "dingus" are also reused many times. There are only two "Swifties" used, and unless this quirk becomes more prevalent in the remaining few volumes of the series, one wonders how such a big deal was made over this phenomenon during the 1960's. The similarity in writing style and attitudes is, in my judgment, pretty conclusive. I feel that Harriet Stratemeyer (possibly working from her father's notes, as he died in May of 1930) is firmly planted behind the typewriter for this one. The story also may have started as a draft written by the author I previously called "Ejaculatin' Jones" in other reviews and then finished by Harriet, as she did a lot of editing late in the series.

Attitudes and Prejudices: The famous Stratemeyer prejudice has turned toward the Italians in this episode. In previous tomes Rad and Koku were continuously referred to in derogatory terms, being called

'boy' or worse. That has ceased, of late. Los Indios caught the brunt during South American and Mexican adventures. During the war years, Germans bore the brunt of racist name calling. Lately, Russians, Persians, Turks and Chinese all took a turn in the shredder. Now, it's the Italians. The only folks that had enough chutzpah to get a retraction were the Jews. A text change was made in late editions of *Talking Pictures*, removing a reference to them. You have to wonder...

The police have gone ineffective, again. Tom apprehends a psychotic crook and the local jail keepers do a "catch and release" on him.

Swift Construction has continued to grow and now has been relocated further away from the family mansion. *Casa de Tomas* also has gotten larger and now has at least two "wings." Tom and Mary reside in one and Barton, Rad, Koku and Mrs. Baggert reside in the other. Previously, the house was simply described as large and Victorian.

Considering how much Summer heat is a factor in this tale, Tom could have gotten *really* famous if he had invented central air conditioning. Willis Carrier got there first in 1923, though, but only public buildings like theaters, hotels and restaurants had his invention installed as the refrigeration machinery was massive.

Tom continues his display of reckless behavior, by flying the *Silver Cloud* into the teeth of a "hurricane" on a test flight. Considering the location (upstate New York) and the small size of these disturbances (in & out in 2 pages) I wonder if these storms were exaggerated. Later, Tom runs aground, getting hung up in a tree after blundering around in a fog bank. If I were piloting, I think it would be a bit safer up high and away from the local topography.

Errata: There is a running gag throughout this series. Mr. Damon's home keeps flip-flopping between *Waterfield* and *Waterford*, NY. Sometimes it is in neither, and several times in both places, at once. This is partly due to the enforced poor communication amongst the many ghostwriters at G&D that contributed to this series.

There are now 4 distinct categories. In this tome Mr. D's home flops to ***Waterford***.

The tally for 33 volumes, to date is:

***Waterfield*-15, *Both places*-2, *Waterford*-10, and *Neither place*-6.**

Typos and malapropisms were almost nonexistent. P55 has "...*we've* (we're) going to and p25 describes the *explosive* nature of Nitrogen. The electric fence surrounding *SCC* seems to come and go, too. On p44 it is there, and on p105 it is not.

It has previously been *de rigueur* for Tom to "rescue" someone, *anyone*, at least once per episode. In this tome, he does it in style, rescuing his entire family (in-laws included) *and* a hotel full of tourists.

Speaking of rescues, The *Big D* is said to be "the only way possible" to rescue the trapped tourists on Mt. Camon. I seem to remember a certain aerial fire extinguisher invention a few episodes back (See Vol. #24) that could have been used to clear a safe path through the fire, at least long enough to evacuate the refugees.

Mention is made about the magic gas I call SwiftLift, being "not as explosive as Nitrogen." I'm sure the author meant to say Hydrogen, as Nitrogen as a gas is inert.

Engineering and Science, Fact vs. Fantasy: Tom's dirigible was made to outdo the 1924 *Graf Zeppelin 1*, the LZ-127. Here's how he stacks up.

Specs	LZ-127 Graf Zeppelin	TS-1 Silver Cloud
Length	776 feet / 236.53 meters	1000 feet / 304.81 meters
Diameter	100 feet / 30.48 meters	Not Specified, but assumed to be about the same.
Gas Volume	3,700,000 cu. feet / 111,000 cu. meters	4,780,000 cu. feet / 143,300+ cu. meters
Engines	Five 550 hp Maybach engines	Six (Unspecified) engines
Maximum Speed	80 mph / 128 km/h	100 mph / 160 km/h cruise 200 mph / 320 km/h top speed
Lifting Gas Type	Hydrogen	SwiftLift
Duration	Not Specified	10,000 miles

The speeds attainable by *Silver Cloud* are said to be due to a combination of streamlined design (no external gondolas or motor pods) and the rigid metal skin. 200mph will tear the fabric off a conventionally constructed airship. Even taking into account the "clean" design, it is not explained how one can go more than 2.5x the top speed of current tech airships with only one more motor. (Six to the *Graf's* five.) The *Akron*, 25% smaller in size and with 8 engines and another 15 years of technical development behind it, could only *match* the 85mph top speed of the *Graf*, not exceed it.

SwiftLift gas is the typical pixie-dust style product that is pivotal in making any airship that Tom designs, work. It is said to be "almost as safe as Helium but cheaper." It would have to be, as filling the *BigD's* envelope would have cost \$48,000 for Hydrogen, and \$72,000 for Helium, in 1915 dollars. I have not accounted for 15 years' worth of inflation (to the dollar, not the dirigible...) or the cost of replacing leakage or vented gas. Also, I can see why *SCC's* piggybank was drained. An original Zeppelin, precursor to the *Graf*, cost \$100,000 in 1915 dollars and had to be funded by special government bonds sold to the German people. Tom's beast would be a large step up from that, and it was privately funded. Talk about a silver elephant!

Once again, we have a rigid shell airship (a la *Red Cloud*) that changes buoyancy by means of some principle other than by expanding a flexible container that holds a lighter gas and displacing heavier air. This volume change and the difference in relative density of the gasses is what creates lift. A rigid shell just gets heavier as you fill it, and you would have to start with a vacuum to get maximum benefit from any gas that you put in it. Otherwise the contents just get diluted.

Who gets to feed the parking meter on this one? The *Silver Cloud* is the best part of a quarter mile in length. Just building a "shed" big enough to keep this beast out of the elements would bankrupt most concerns. Tom should have just considered roofing over a mountain valley. The topography of upstate New York would almost support the idea.



It's a quarter mile walk to the other end of this "garage."

Talk about urban blight...

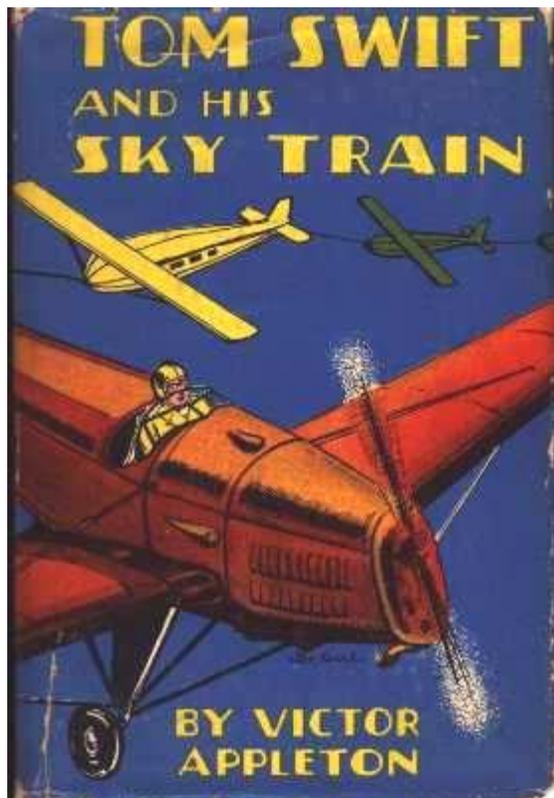
Geography: This author remains enigmatic about Shopton. It is still not specified as to which state it is in, however, it is now a "small city," and a "great lake" is about 200 miles away, by air. The east edge of Lake Ontario is more like 125mi from "Shopton" but Rochester, NY is almost exactly 200mi. Since Mansburg is once again the nearest "large city," we can assume it is still sitting in New York State, on the shore of Lake George/Carlopa. Mount Camon, location of the resort hotel, is said to be about "two days' auto ride" (120mi as the crow flies) away from Shopton. Interestingly, a Google search turned up a historic Catskill mountaintop hotel a few miles south of Kingston, NY. The Mohonk Mountain House, established in 1869, has all the characteristics of the fictional hotel, including extensive flower gardens. It could easily have been the template for Mt. Camon, except for the presence of a beautiful lake that would have made this story less "thrilling."



JP Karenko, 10/26/05

#34. Tom Swift and his Sky Train (1931) (Review 1)

Or, Overland through the Clouds



Summary: No official summary was ever provided with any of the old Tom Swift books. However, the plot can be summed up as follows:

When the book opens, Tom Swift is working hard on his latest invention, the Sky Train (see description below). However, working on the Sky Train isn't as easy as it could be -- first his experimental sky train crashed, and then the bank denied a crucial loan, and then his Sky Train crashed again (into the greenhouse of the irate president of his bank!), and then it almost crashed again. Could it be sabotage?

If this wasn't bad enough, the Acton firm is sponsoring another, rival Sky Train in hopes of beating Tom Swift to the market. A World Exposition in which airplanes feature highly is to be held in San Francisco shortly, and both want to be the first to be there. In fact, it blossoms into a race: on a certain date at a certain time both Sky Trains are to take off, and whoever gets to San Francisco first will receive a huge amount of money -- money Tom Swift can't afford to lose.

Who is behind the sabotage, if it is indeed sabotage? Will Tom Swift win the prize? It's all there, in *Tom Swift and his Sky Train*.

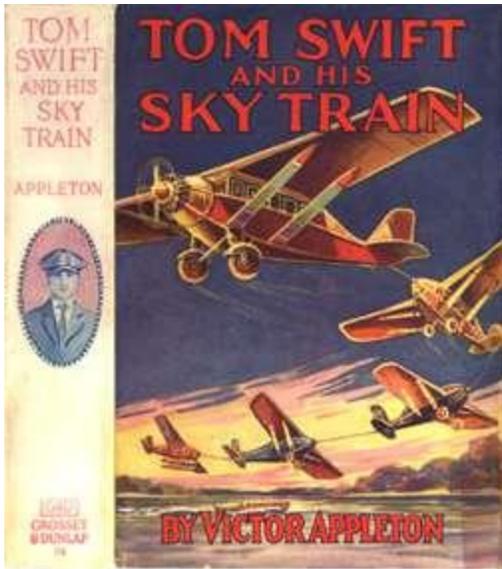
Major Inventions

(The image in the section below is from the collection of James D. Keeline)

There is one major invention in this book, and that is, of course, the **Sky Train**. The Sky Train is just what its name implies -- a train that flies. The design of the train is simple: at the front of the vehicle is a large and powerful plane. Coupled to this large and powerful plane is a number of simple, large-capacity gliders. The idea is this: the main engine of the plane stays in the sky permanently, except for maintenance (it's refueled in mid-air, I believe). Smaller planes tow the gliders into the sky and then let them go; skillful

pilots position the planes to where the couple grabs them and they are fastened. To let a plane go, the couple is simply de-coupled, and the glider gently "volplanes" down to earth.

The reason such a design was commercially practical was because of the airplanes of the time. In the 1930's, when this book was written, airplanes were small, slow, and could hold relatively few people.



Building a 777 and filling it with 400+ people was completely out of the question -- the designers of the time just couldn't handle the load. Getting from coast to coast could take quite a while, especially with several-hour stops and delays. Having more passengers added and taken off in mid-air, while the airplane was still flying along, saved people enormous amounts of time.

Tom, therefore, found an easy way: simply take one powerful, fast airplane, a number of gliders, and hook them together. Over a city, drop a glider or two off here, pick up a glider or two there. I know that it sounds ridiculous, but one has to remember what airplanes were like in the old days.

The Sky Train, of course, was never built. Planes are fantastically powerful now, and are capable of hauling passengers from England to Australia in one flight. Such a grand and complex scheme as the Sky Train simply isn't needed. Still, one wonders.

What if the Germans hadn't looked into designing the jet engine? Had things turned out differently, we just might have built a Sky Train.

Some portions of the book that talked about the mechanical aspects of the Sky Train are:

"Huh! Sky train! Sounds foolish to me, but go on!"

"Well, it isn't quite as foolish as it may sound," Tom said, trying to keep his temper. "As you probably have heard, there is to be held, shortly, on the Pacific coast one of the biggest air meets in history. I have sent some exhibits out there and I am planning to send another, my big dirigible, Sliver Cloud. All those are perfected inventions -- they all work -- and so does my experimental sky train..."

"In brief, my sky train will consist of a powerful airplane, of a cabin type, capable of carrying say a score of passengers," Tom said. "If this was all there was to it I wouldn't be troubling you. But while planes carrying passengers from coast to coast are not uncommon, my plan of attaching to the towing plane a number of smaller planes, without motors, which are called gliders, is new. And my plan of having the towing plane pick up gliders, filled with passengers, at various flying fields between here and the coast, and taking them along, dropping them off as a railroad train drops off coaches at local points, is also new."

"Do you mean to say," burst out the bank president, "that you propose to fly a train of gliders through the air, starting here in the east, pick up other gliders at intermediate points, dropping off some, picking up others and like that?"

"That's exactly what I propose to do," said Tom, smiling.

"It can't be done!"

"Excuse me, but it has been done," Tom said. "I have just come from a test of my new invention. You realize, Mr. William, that it is comparatively easy for a towing plane to start from the ground, towing motorless gliders -- any reasonable number of them. But by my plan, the last glider in the train can be cut loose at any determined point, and will go down to the ground say at Chicago, Denver, or any place between here and the Pacific coast."

"You mean you just cut loose those gliders filled with passengers and let the drop?" asked Mr. William. "That's foolishness! Dangerous! They'll all be killed."

"No," went on Tom. "The Gliders will land as gently as any regular airplane. Each glider will be in charge of a competent pilot who will ease it down to earth. But that is only of my plan. I want to make my coast to coast sky train a sort of express, without stops. And I plan to have it pick up loaded gliders at certain points and pull them out to the coast."

"You mean you're going to dip down in that big airplane of yours, with a string of gliders for a tail, like a kite, and hook on to some other glider, or gliders, waiting on the ground? That can't be done! There would be a grand smash! You needn't think I'll lend you money on such a wild scheme!"

"You don't quite understand," Tom went on, patiently. "I don't propose to pick up gliders from the *ground* with my sky train. The glider, or gliders, at intermediate points, filled with passengers, will be hauled *into the air* by an auxiliary motored plane at each landing field, and will be coupled to the rear of my sky train while it is in full flight."

..."Let me see if I get you, he said to Tom. "You propose to start a sky train, consisting first, of a big motored airplane, say from New York, and head for San Francisco. Towed by the big plane will be several gliders, carrying passengers. One glider will have in it passengers who, we'll say, want to land at Chicago. When your sky train gets there, you'll drop off the last glider. Is that it?"

"I won't exactly *drop* it off," Tom said with a smile. "I will simply uncouple it, as a brakeman would uncouple a railroad coach from the rear of a train. The glider, guided by a pilot, will make the landing safely. At the same time an auxiliary-motored plane on the Chicago field will soar aloft, towing a glider of passengers who want to go to San Francisco. The glider will be coupled to the rear of my sky train in place of the one left off over Chicago, and the plane that brought it up will circle back to the field."

"Well, I can understand the principle of the thing," grudgingly admitted the bank president. "It sounds all right in theory and I'll admit that we're getting to be quite an air-minded country. But will your plan work and will it pay?"

"It will work," said Tom, with more confidence than he felt since the accident. "And I'm sure it will pay. There is a growing demand for rapid transportation between here and the Pacific Coast,"

"Yes, I admit that. But a sky train! All nonsense, I should say!"

...

"Yes. You know, up to now, and before, the tail glider could be released by either the pilot in it or by me, or someone else in the hauling plane. That is, after a signal was given. But this was the weak spot in my invention. You see, I, or someone in the plane, might forget to give the signal, and cur the glider loose, or the pilot in the glider might do the same thing. But with dual double control it isn't possible."

"Why not?"

"For the same reason you can't open your bank safe deposit box all by yourself. A clerk from the bank has to turn half the lock with his key, and you, or he, has to turn the other half with your key. You can't get in with your key alone and the bank clerk can't get in with his key alone. It means dual double control and makes for safety."

"Now if I can change this magnetic coupler a bit, no glider can get loose from my sky train until the pilot in the glider and the pilot, or some responsible party in the same plane, act in concert. That will end all accidents, I think."

...

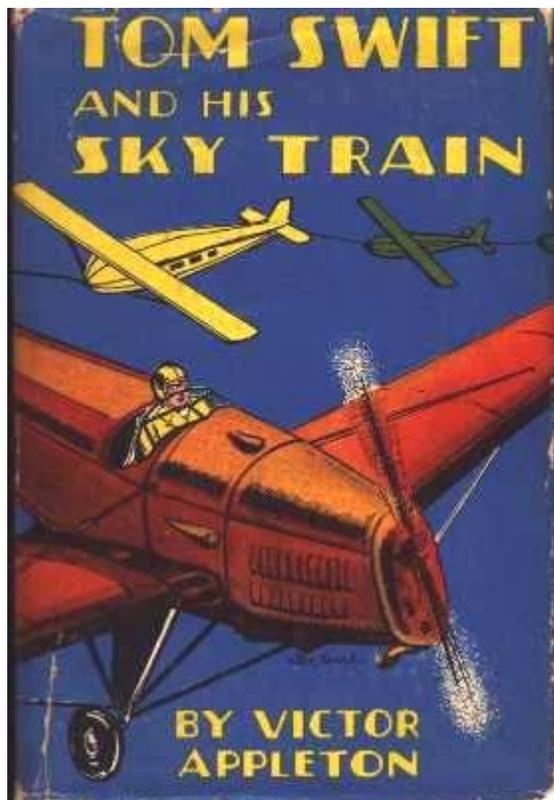
The descent of the sky train glider was the signal for the plane on the ground to start upward with its glider in tow. Getting off to a good fine start in the wind, the small plane rapidly gained height and speed until it was flying after the Eagle that now had but one glider in its "tail."

"The idea," Tom explained to Ned, "is for the lifting plane to come after us, and a little above, regulating her speed until she is flying evenly with us, keeping her glider on a level with our rear one. Then she gradually goes a bit faster until the nose of the raised glider couples to the tail of the other glider. As soon as contact is made the plane cuts loose, zooms up and goes back to the ground."

#34. Tom Swift and His Sky Train (1931) (Review 2)

or, Overland Through the Clouds

Review by JP Karenko, November 2005



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

Tom Swift has decided that the time it takes to cross the continent by air is Just Too Long. He has decided to one-up even his own best invention, the *AirLine Express*. (See Vol. #29) The ALE can make the trip in 16 hours, but only can carry 10 passengers. It is limited to "express" operation, meaning no intermediate stops, except to swap power-train units in Chicago and Denver. The *Sky Train* is a string of pearls. A powerful tow plane drags a group of up to 5 gliders, strung nose-to-tail. Each glider can hold up to 20 passengers, and these gliders can be coupled and uncoupled, as railroad cars are. This allows for intermediate stops. The other unique part of the concept has to do with this maneuvering being done "on the fly" as it were.

All this hardware costs lots of money. More than even the mighty SCC has in its' coffers. Finances, and the finagling necessary to get the funds to build these devices are more than half of the story.

There are also a series of suspicious "accidents" that occur during the testing of the *train*. It looks like a saboteur is at work, but why? How these problems are resolved, you will have to locate a hard cover copy of the book to find out.

Cast of Characters (More or less in order of appearance)

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical

Ned Newton--Chum & companion of Tom. His description is never given. He continues in his position as Swifts' financial advisor and CFO (Treasurer) of Swift *Construction Company*. In this tale, he cautions Tom about the precarious financial shape SCC is in.

The Sky Train Squadron #1--Pilots and crew of the first test flight.

Mason--NFN or description. Swift Construction Employee. Pilot of tow plane.

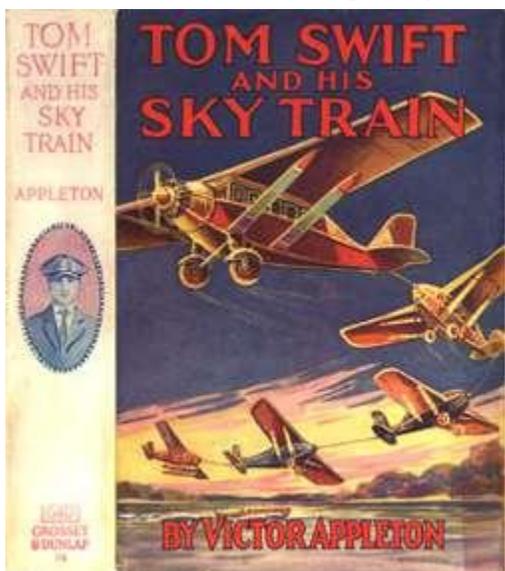
Porton--NFN or description Swift Construction Employee. Pilot of towed glider.

Northrup--NFN or description Swift Construction Employee. Pilot of towed glider.

Mr. Placent--NFN or description, except "easy to do business with." Former head of Shopton Bank.

Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited cognitive facilities. Described as "savage and only half-tame," he is antagonist and rival of Eradicate. In this episode, he has shrunk, and "is *nearly* 8 feet tall." He continues as watchman & guard at SCC and his other chore of antagonizing Rad.

Garrett Jackson--No description given, but is spry and fit for his age. (Volumes written 15 years previously, described him as an "aged Engineer.") He is now *Swift Construction Works Manager/Superintendent*.



Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro manservant. He is now going deaf and is described as "aged, decrepit, wizened and shuffling." He remains faithful to the Swift family and helps out where he can. Constant rival and antagonist of giant Koku. In this tale, his only function is as personal attendant to Barton Swift.

Davis Daniel--Young assistant hired by Tom as a designer, draftsman and office gofer. Sullen expression and unhappy demeanor. Lives a troubled life.

Edgar--NLN or description. Shopton Country Club Valet. Walk-on part.

Lester William--New Shopton Bank President--Grey eyes, heavy jowls and coarse manners. Smokes cigars and plays golf badly. Overall royal pain-in-the-pooter for Tom.

Mrs. Mary Nestor Swift--Radiant bride of Tom who is described as a "very pretty young woman with flashing brown eyes, and a sweet trilling laugh." Blushes easily, especially around Tom. In this tale, she is found on the links playing golf with some of her female friends. Seems to be becoming a bit of a nag, and spends quite some time trying to pry Tom away from his work. "Murmurs" a lot during dialog.

Two for Tea--Lester William and Unidentified Other. The "other" may be one Taylor Burdick, below. Both seem to be plotting mayhem against Tom.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. Never fully described, in previous tales he was "portly" with a moustache and

"tortoise-shell glasses." Is quite wealthy and on the board of Waterfield Bank. While he has an ongoing problem with travel conveyance trouble, in this tome, he doesn't manage to smash anything. Off the leash and running wild, as his wife is out of town. (Again!)

Taylor Burdick--No description given. On Board of Directors of Waterfield Bank. Friends with Lester William.

The Sky Train Squadron #2--Pilots and crew of the second test flight.

Lacter & Turtan--NFN's or descriptions. Pilots of tow plane *Eagle*.

Glider #1--No names or descriptions of crew or occupants.

Glider #2--No names or descriptions of crew or occupants.

Glider #3--No names or descriptions of crew. Koku is passenger.

Glider #4--**Miskon** (NFN) Pilot. No names or descriptions of other occupants.

Glider #5--**Blanchard & Lee** Pilots. No descriptions. Davis Daniel, passenger.

Model-T Teddy--Faceless and nameless country lad in ramshackle auto who aids Tom in finding a downed glider.

Mrs. Lester William--Pathetic, drooping and nervous wife of "Big Les." As described, she is probably an early victim of what is now called domestic abuse.

Williams' Maid--No name. Faceless mouse. Walk-on part.

Miss Mapes--Tom's Secretary/Stenographer No Description or first name.

Jed the Jeweler--Shopton retailer, who repairs a pearl necklace for Mary Swift.

Ollie the Oldster--Elderly auto driver who has a "senior moment" and almost wrecks Tom & Mary.

Davy Daniel--Son of Davis Daniel, Tom's designer. 5 years old, dressed in red "knickers" and suffering from a degenerative eye condition that will make him blind unless treated.

Dr. Mercy Me--Shopton Mercy Hospital attending physician. Treats Davy for bumps and bruises. He gets clipped by Tom & Mary's car, while they are trying to avoid getting T-boned by Ollie, above.

Mrs. Kalthan--Surrogate grandmother to Davy Daniel. Old neighborhood lady who looks after him.

Jorgin--NFN or description. *Swift Construction* employee. Pilot of towed 5th glider. See Errata.

Nosy Newsmen--Pusillanimous Paparazzi, still hand-cranking their movie cameras. They now have "talkie" attachments to record sound. Tom's electric powered *Wizard Camera* (See Vol #14) has been around for almost 20 years and still hasn't caught on? Someone needs to shake up the marketing department at SCC.

Helen Morton--No description. Love interest of Ned Newton first introduced in Volume #29. She is now engaged to Ned. (Well, they have been dating for a while...) Freeboard passenger in the first transcontinental trip of the *Sky Train*.

Barton "Bart" Swift--On the dust jacket of *Chest of Secrets*, his appearance is remarkably like that of Robert E. Lee, but with glasses. Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. In this episode, he has once again declined in his health, and is unwilling/unable to go on the record-breaking first trip of the *Sky Train*. Now being attended almost full-time by Eradicate Sampson.

Sergeant Sam--Shopton Beat cop. No name or description. Crowd control boss.

Patrolman Pete--Shopton Beat cop. No name or description. Walk-on part.

Newsy Nick--Reporter for a *San Francisco* paper. Carries a large, gold-headed cane. Walk-on part.

Broadcaster Bob--The man with the microphone. Interviews Tom for the *Universal Broadcaster Company*, after the momentous landing in California.

As is usual lately, many of these characters (especially the ones introduced late in the story) do not rate any development or even a description. They are brought forth and discarded after they do their bits to make the story flow. The (hopefully humorous) alliterative names are my "inventions" to make reading these reviews a bit more fun.

Major Inventions

In the simplest terms, Tom has designed a passenger train that rides the clouds, instead of steel rails. A powerful tow-plane has hitched to it a string of un-powered gliders that can be coupled and dropped off as the "train" passes over various cities. Up to five gliders, each holding as many as 20 passengers, can be attached like a string of pearls. Time is saved, as the need to stop and wait for embarking and disembarking is eliminated.

Couplers are magnetic, with indicator lights and dual activation needed to avoid accidents. They also have floatation capability for emergency landings in water.

Commentary on Society, Attitudes, Environment & Errata

Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted. It also has given me a grasp of just how technologically and culturally unsophisticated the average reader was in the early 1900's.

Attitudes and Prejudices: Some *clues* (although that term is no longer used) that were detected as to the author of this tale: This tale reeks with a string of *coincidences* that are required to allow the story line to progress. The story also requires significant *foreboding*, (bordering on clairvoyance,) to prepare for events that make the plot flow. The author's engineering knowledge is minimal, but some techno-things are actually described correctly. (See Fact vs. Fiction, below.) Language remains a mix of modern slang and

older English. The author discovered the word "jiggers," and uses it seven times. The words "Jove, (5 times)" "muse" and "dingus" are also reused often. There has been a lot of gunplay in the last few stories, but in this one, there is none. Emphasis is on finances and money troubles. (After all, we are well into the Great Depression.) It may be this story was blocked out by Russell Adams (Harriet's husband) who was a securities broker, and then possibly finished from his notes. From the "look and feel" of the story, I think Harriet Stratemeyer is firmly planted behind the typewriter for this one, at least as editor.

Cars now have license plates, and a "special government permit" is now required to make transcontinental flights. Mrs. William (with a little prompting from her husband) has a spontaneous case of "mental anguish" after a glider demolishes her greenhouse. Tom gets threatened with a lawsuit, and has to send a lawyer to settle out-of-court. Reporters are still "making" news, rather than getting the facts straight and merely reporting them. Tom invents the old "they *all* do that" excuse used today by new-car service managers, everywhere. When a sabotaged coupler lets go, unexpectedly, causing a forced landing of a glider on *Lake Carlota*, Tom baldly lies to conceal the real circumstances of the near crash, by saying "it's part of the test." Seems Our Knight's Shining Armor isn't *quite* as shiny as originally advertised...

Errata: There is a running gag throughout this series. Mr. Damon's home keeps flip-flopping between *Waterfield* and *Waterford*, NY. Sometimes it is in neither, and several times in both places, at once. This is partly due to the enforced poor communication amongst the many ghostwriters at G&D that contributed to this series.

There are now 4 distinct categories. In this tome, Mr. D's home flips to ***Waterfield***.

The tally for 34 volumes, to date is:

***Waterfield*-16, Both places-2, *Waterford*-10, and Neither place-6.**

Typos and malapropisms were nonexistent. Nothing jumped out at me.

It has previously been *de rigueur* for Tom to "rescue" someone, *anyone*, at least once per episode. In this tome, he picks up an urchin who literally walks into the side fender of Tom's Runabout, and gets knocked down. It turns out he is the son of Tom's office assistant and is going blind, probably due to Glaucoma.

Davis Daniel is always around when things go wrong. In spite of no less than a half dozen different references to him "needing to be watched closely," *he isn't*. There's an old saying, "Once is happenstance. Twice is coincidence. Three times is enemy action." Six times is stupidity, but it does stretch the story and give us a convenient bad-guy to pin things on, later...

I sometimes wonder why *SCC* can't retain staff? The guys below were pilots in the *Airline Express* adventure. They seem to all have moved on to greener pastures...

Harry Meldrum, Chief Pilot. Bert Dodge, Co-Pilot.

Sam Stone, Chief Pilot. Jim Waldo, Co-Pilot.

Ted Dolan, Chief Pilot. Art Wright, Co-Pilot.

None of them are present for this episode. Speaking of crew changes, The 5th glider pilot(s) on a near disastrous test flight were described as Blanchard & Lee. Later, the author changes the crew to a single someone named Jorgin.

Engineering and Science, Fact vs. Fantasy: The energy needed to fly a glider at speed is described correctly. It is minimal. Overcoming the inertia of a loaded "train" and dragging those gliders into the air off a comparatively short runway, sounds like an engineering **Fantasy** to me. The action of a strong acid was also described correctly, but I'm not sure it would have eaten through a leather shoe sole quite as fast as what was described.

Why Do This? There is quite a bit of engineering in the *Sky Train*, but I wonder if the concept really was thought through. Details kill many a fine idea. The idea of coupling up to 5 gliders behind a tow-plane, is a concept that could probably work. The question that begs is "why?" The concept as proposed is to save the time involved in landing and transferring passengers at intermediate stops (assumed to be Chicago and Denver) on a coast-to-coast route. The time saved could possibly cut an hour or maybe two off a transcontinental journey, only if they went straight through. The other concern is *at what cost?* If one were really in a hurry, why not use the *AirLine Express*, from several volumes back? As a customer, I for one, would gladly sacrifice an hour (or even two) knowing that if my plane had to "go around" to avoid some hazard on the runway, the pilot could do so. Landing "*dead stick*" didn't get that moniker because it was the safest way to do things.

Fly United? The idea of dropping off the hindmost glider in this sky-train is trivial. Hooking up is another matter. All the illustrations I have available (dust jackets only-my copy of the book is a Whitman without frontispiece) show the gliders attached with intermediate cables. This would be ideal (and necessary) for taking off safely from the ground. Hooking up to a flexible, but substantial connection flapping in the slipstream *while airborne*, would be a challenge. Ask any Air Force or Navy pilot who has had to do an air-to-air refueling maneuver.

In college, we were taught the **Three Immutable Laws of Engineering**, to wit:

1. Water flows downhill
2. You can't push on a rope
3. Gravity is an illusion-the world sucks.

Tom's invention, as illustrated, pretty much violates Law II. The text, however stated that these "couplers" are actually rigidly mounted to the airframe, as in railroad cars. (They thump and bang together during operation.) Solid connections could make the concept work better, since Law II is no longer an issue, but I have not yet decided about the stability of a string of aircraft, strung rigidly nose-to-tail. Taking off loaded & inflexibly coupled, could be suicidal from a stability standpoint.

Approach With Caution-A better, more viable way to safely approach the airborne train would also have to be worked out. The story had the towed Tail-End Charlie being attached to a local powered "switch engine" plane from above. This means the glider pilot is very limited in his options for controlling his craft. The glider is at the mercy of the skill of the tow plane pilot, who is operating at a cables' length distance

and can't even *see* the glider. (It is behind and below him.) There is also turbulence from all these aircraft being in close proximity to contend with. Modern air rendezvous techniques approach from behind & below. The pilot of the rear plane has a clear view of what is happening and better control as he is out of the wash of propellers and/or jet exhaust. The upper plane has an observer whose only job is to "fly" the coupler (in this case a fuel hose) on to the following plane's attach point. Tom's way sounds risky.

For talking purposes, let's assume the issues of safe couple and decouple are indeed solved. We now have a string of 5 aircraft: A tow-plane and 4 glider "coaches" leaving New York and headed to San Francisco via Chicago and Denver. The tow plane holds 20 passengers. They are pre-selected to go to the "end of the line." Limiting the number of "cars" in this train is better (and safer) in this case.

That Left Turn at Albuquerque. 1st question: Why 4 gliders, as there will only be two stops? OK, let's say there will be a few intermediate drops without corresponding pick ups, or lots of passengers (more than 20) for a given stop. The Tail-End-Charlie (#4) has passengers for Pittsburgh. He gets dropped OK, as they zoom past. Next glider up, #3 in line originally, but now last, has passengers for Chicago. He gets dropped and a new #3 coach with passengers for Denver or SF is picked up. Wait-a-minute! The folks in coach #2 want to get off at St. Louis. Hm! #3 is now *in the way*. On a ground railroad, which this device is sort-of patterned after, you end up on a siding for at least a little while the car(s) on the train are re-ordered. You cannot just drop off the hindmost coach "on-the-fly" like what is proposed, in the story. Well, Tom says you can...

This situation above, can get solved a couple of ways. One is by limiting the number of stops to the number of towed aircraft, (minus one) and limiting the destination of the picked up craft to "the next stop." (Note that the economics of this whole scheme are staring to unravel...) The other way is what Tom proposed: That is to couple and uncouple gliders at the intermediate stop(s) and rearrange the pearls on the string, as a rail train would. This doubles or triples the risk of an accident, and nobody has accounted for the fact that the *Sky Train* is zinging along at 200mph while all this "re-shuffling" is going on. That's why they put railroad cars on sidings to do this. Those extra tow-planes and crews are also a significant overhead.

Who Said "Bag It?" Another item, no one has bothered to take into account the effect of slipstream turbulence on this string of aerial jewels. As you go further back down the line, the ride gets progressively bumpier. Since this is a premium service, the little paper bags in the seat back must have fancy gold embossing. Anyone who has played "crack the whip" on ice skates knows what being last in line is all about. Tom's "gyroscope stabilizer" is installed in all the gliders, but a gyro can only do so much. Anybody that has played with gyros as a child knows that the "stability" they afford comes at a price. Any sudden attempt to force changes in the glider's (or gyro's) attitude means there will be a corresponding sudden *unwanted* change at 90 degrees to the original movement. This skewing movement could cause a wreck all by itself.

Also, the tow plane now has to now have transcontinental capability. The aircrews will also need the stamina to fly coast-to-coast without a break. Previously, this was a big problem, and crew changeovers were mandatory at the major terminus stops.

Amtrak, Anyone? This begins to sound more and more like "it ain't worth it." Take a *real* train, folks. It's less risky, cheaper, and you won't get airsick from all the jockeying around. Plus, you actually get to *see* the scenery as you go by...

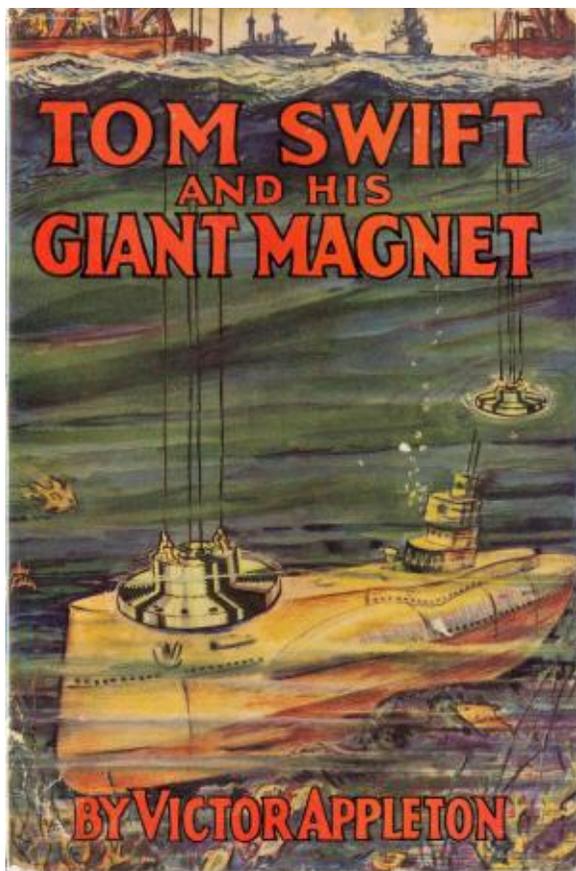
Geography: The author remains enigmatic about *Shopton*. It is still not specified as to which state it is in. Previous volumes specify "*this state*" as New York. *SCC* now covers an area "many miles in circumference." There is also a full-fledged airport on the grounds. Considering the topography of upstate New York, especially near *Lake George* (excuse me, *Carlopa*,) I wonder where Tom found so much level real estate? We also have two new large cities on the map. *Portboro* is about 100 miles away, and *Kenville* is 300 miles from *Shopton*. I again wonder at this constantly changing topography. I think it would be simpler to just drive a tack in the map, pick a half dozen landmarks, and reuse them from story to story. *Mansburg* and *Waterfield/ford* seem to work OK.

JP Karenko, 11/02/05

#35. Tom Swift and His Giant Magnet (1932)

or, Bringing Up the Lost Submarine

Review by JP Karenko, November 2005



things turn out.

Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

It has been six months since the *Sky Train* made its successful flight. Fame and Glory have brought much new business to *Swift Construction (SCC)* in spite of the Great Depression. So much so, that Tom is rather annoyed that making money is getting in the way of his inventing. A local scrap yard owner comes to Tom with a desire to have a bigger better and more powerful magnet made so he can process all the metal coming through his yard more efficiently. A rival dealer who specializes in marine salvage, also approaches Tom and a competition ensues to see who gets their bigger/better magnet first. Tom, of course, is up to the task, and dives right in, literally speaking. (While working on a midnight test of the waterproof version of the magnet, he gets a blast of electricity, falls into the test tank, and nearly drowns.)

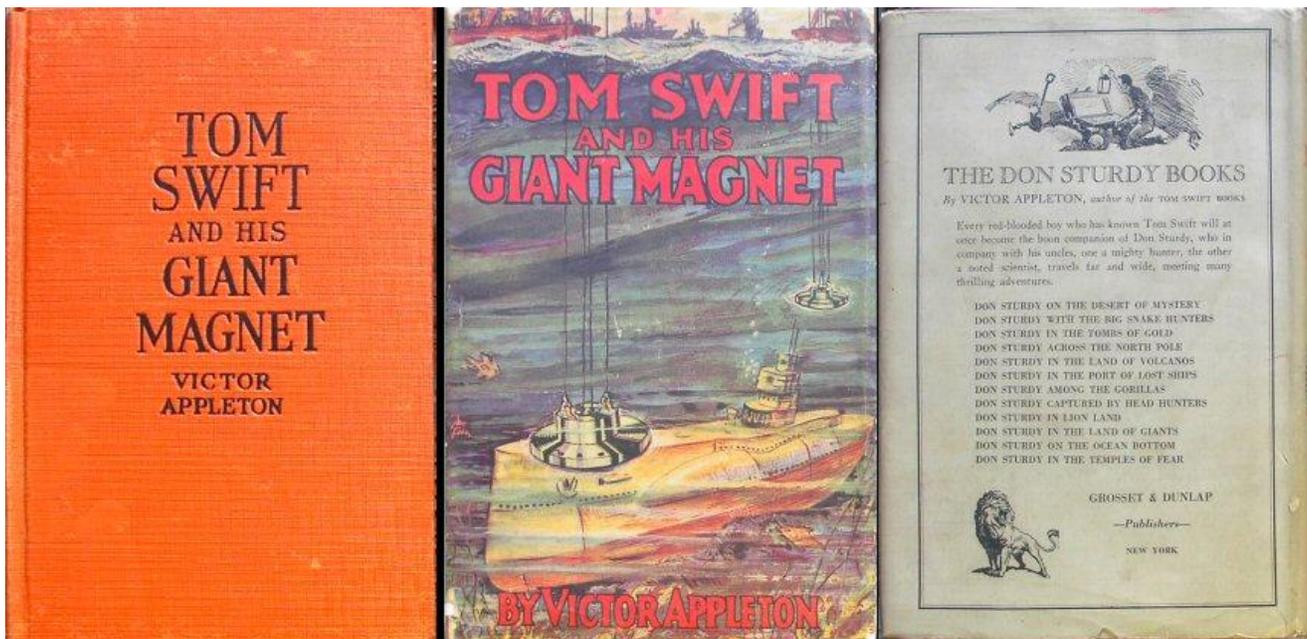
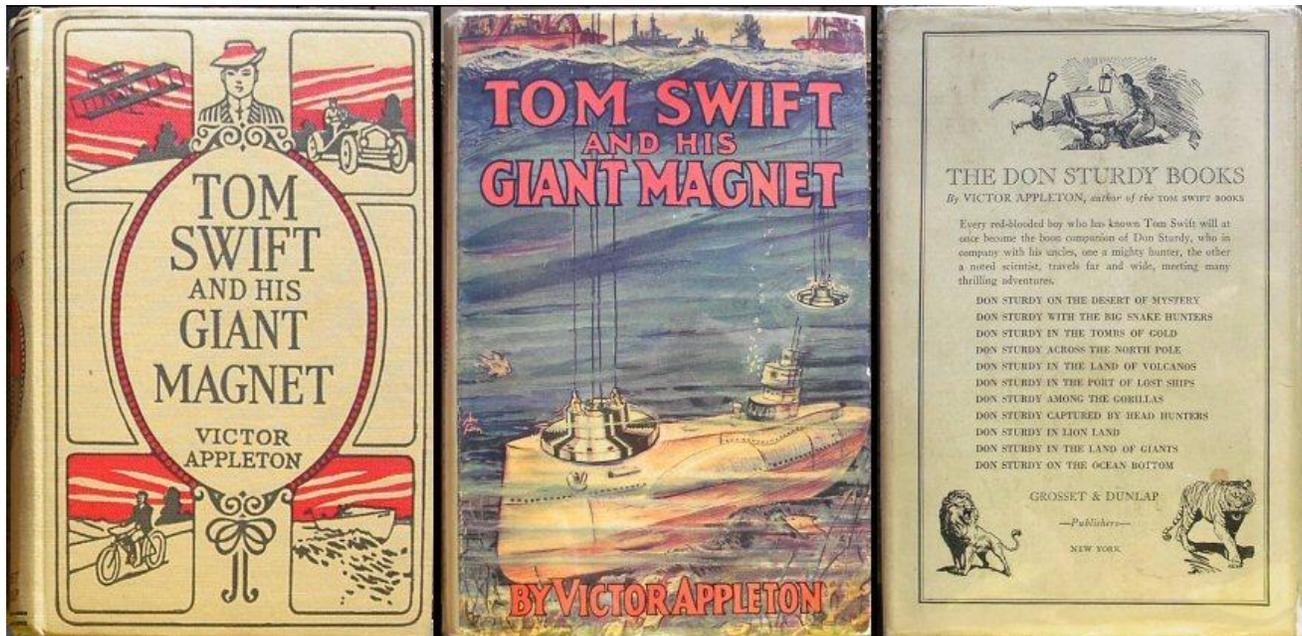
As luck would have it, he and the marine version of the magnet are in the neighborhood when the Navy's latest sub, the *SVJ-13* is disabled during her shakedown and only a *Giant Magnet* can save the sub and crew. You'll have to find a hard cover copy of this tale to find out how

Dustjackets

The Grosset & Dunlap version of this book came in two formats: the original (and hard-to-find) brown quad format, and the more common orange binding. The brown quad format is the book's first edition, and copies of it in that format can be expensive, especially if they come with a dustjacket.

Each version of the book came with its own different dustjacket; the dustjackets for the two G&D formats are not the same, although they are very similar. The difference is very slight: on the back of the dustjacket that was on the original brown quad book the title listing only lists to DON STURDY ON THE OCEAN BOTTOM and has a picture of a tiger on the bottom-right-hand corner of the dustjacket. The back of the orange G&D book lists to DON STURDY IN THE TEMPLES OF FEAR and does not have the picture of the tiger.

Both dustjackets can be found below, for your viewing convenience. These images come from the collection of Mark Snyder - thanks, Mark!



Cast of Characters (More or less in order of appearance)

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. Never fully described, in previous tales he was "portly" with a moustache and "tortoise-shell glasses." Is quite wealthy and on the board of Waterfield bank. He now carries a hollow steel cane/walking stick, as he has had problems with stray dogs while on his daily "constitutional" walks. He has ongoing issues with safely controlling the vehicles he rides in, crashing frequently. In this tome he drops a new "coupe" into *Lake Carlopa* after losing control on a bridge over turbid waters.



Ned Newton--Chum & companion of Tom. His description is never given. He continues in his position as Swifts' financial advisor but has apparently been promoted at *Swift Construction Company*. In this tale, he is now the "General Manager."

Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited cognitive facilities. Described as "savage and only half-tame." In this episode, he has a new twist on an old phobia. He can't stand fish, and is terrified of them in or out of water. We also find he loves going to the movies, which he calls the "shouting pictures." He continues as watchman & guard at *SCC* and his other chore of antagonizing Rad. This time, he goes too far and plays a practical joke on Rad that nearly results in injury to his rival.

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. In this tale he is frustrated with the "business" aspects of being an inventor and wants to be left alone to play with his toys.

Joseph Harburg--Marine salvage/dealer in scrap iron. Hostile, arrogant, threatening, unscrupulous & domineering. All-around pain in the ashcan.

Franklin Parlet--No description. Shopton scrap-yard owner. Wants Tom to build a better magnet to load and unload junk in his yards.

Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro manservant. He is now going deaf and is described as "aged, decrepit, wizened and shuffling." He remains faithful to the Swift family and helps out where he can. Constant rival and antagonist of giant Koku. In this tale, his only function is as personal attendant to Barton Swift. He calls Tom "Masr."

Mrs. Mary Nestor "Missy" Swift--Radiant bride of Tom who is described as a "very pretty young woman with flashing brown eyes, and a sweet trilling laugh." Blushes easily, especially around Tom. In this tale, is Suzy Homemaker, and we find out she does not like submarines.

Lt. Joseph "Joe" Nestor, USN--Young & handsome cousin of Mary Nestor. Annapolis graduate and submariner.

Garrett Jackson--No description given, but is spry and fit for his age. (Volumes written 15 years previously, described him as an "aged Engineer.") He is now *Swift Construction Shop Manager/Superintendent*.

Mrs. Baggert--Majordomo & housekeeper of the Swift Manse. In charge of "several" maids. Mother figure, she loves Tom like a son. Conspicuously absent during the last few stories, she is now visiting her sister.

Capt. Blake, USN--NFN or description. Commander of Submarine *SVJ-13*.

Barton "Bart" Swift--On the dust jacket of *Chest of Secrets*, his appearance is remarkably like that of Robert E. Lee, but with glasses. Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. In this episode, he is only described as "old and feeble." Now being attended full-time by Eradicate Sampson. No significant role in this tale.

Masked Midnight Marauder--Later determined to be a disgruntled discharged employee. (See Jim Dunberry, below.) Drugs Tom, steals the plans for the magnet. & sets fire to the lab.

Watchers In The Dark #1--Night time security force that guard the shops during 2nd & 3rd shift operations. Come in response to a burglary.

Tredwell--Pattern Shop-NFN, elderly.

Mortimer--NFN or description.

Jansen--NFN or description.

Larimie--NFN or description.

Choo-Choo Chums--Run the work train that tows Tom's magnet to a test on the shore of *Lake Carlopa*.

Bill--NLN or description. Work train engineer.

Jim--NLN or description. Fireman/stoker.

Assorted State Troopers--No names or descriptions. Aid in rescue of Mr. Damon.

Watchers In The Dark #2--Additional night time security forces that guard the shops during 2nd & 3rd shift operations. Come in response to a fire in Tom's lab.

Parker--Casting Shop-NFN or description.

Javison--NFN or description.

Unnamed Other--NFN or description.

Thornton--Blueprint Shop-NFN or description.

Variden--Brass Shop-NFN or description.

Jim Dunberry-The Masked Marauder--No description, except married with a child. Disgruntled ex-employee, discharged for theft. Wants to "get even" for losing his job. Steals the magnet plans, sets a fire and intends to extort money from Tom for the safe return of the purloined blue prints.

Mrs. Dunberry--NFN or description. Terminally embarrassed by her husband's actions.

Good Eats Gary--Faceless Negro cook on Harburg's Salvage Barge 'A' who distinguishes himself by providing delicious hot meals to the workers.

Captain Marsden-Skipper of Tow Tug 'A'--NFN or description.

Captain Blaker-Skipper of Salvage Barge 'A'--NFN or description.

'Sparks' Rothven--Radio operator on Barge A. No description.

Commander Ellison, USN--Commander of rescue task force trying to raise *SVJ-13*.

Clifton--NFN or description. Barge A Boss.

Destroyer Dan, Capt.USN--Faceless & nameless Navy Destroyer Driver.

Menagerie of Menacing Marines--Storm aboard Barge A to "request" assistance from a recalcitrant Joseph Harburg.

Jensen--NFN or description. Barge B Boss.

As is usual lately, many of these characters (especially the ones introduced late in the story) do not rate any development or even a description. They are brought forth and discarded after they do their bits to make the story flow. The (hopefully humorous) alliterative names are my "inventions" to make reading these reviews a bit more fun.

Major Inventions

The magnet that is invented by Tom Swift is "giant." Current <sic> technology of the day was represented by electromagnets in the 36 to 60 inch range. These are capable of lifting several thousand pounds of ferrous metal, especially if it was in a solid mass, such as a steel casting. No diameter or other dimensions were specified, but Tom's magnet was able to lift "thousands of TONS" of metal at a time. (See Errata.) It operated from a DC dynamo producing 2500V and was air-core and light weight for its' size. The magnet is so strong that the derrick and lifting cables are now the weak links in the system.

It also produces a magnetic field so stupendous that a "negative shield" had to be developed to keep it from attaching itself to the derrick. Insulated rubber suits had to be worn by operators, for protection. It could also suck coins right through a pants pocket, which made it unique, as the specie of the day was limited to copper, silver and gold. Steel pennies did not show up until WW2 (1943) and the familiar "nickel" coin is non-magnetic.

Commentary on Society, Attitudes, Environment & Errata

Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted. It also has given me a grasp of just how technologically and culturally unsophisticated the average reader was in the early 1900's.

Attitudes and Prejudices: Some *clews* (although that term is no longer used) that were detected as to the author of this tale: This tale reeks with the usual *coincidences* that are required to allow the story line to progress and also requires significant *foreboding*, (bordering on clairvoyance,) to prepare for events that make the plot come out.

The author's engineering knowledge is adequate, and some techno-things are actually described correctly. (See Fact vs. Fiction, below.) There is a large amount of padding in the story that boosts the page count, with æ of a chapter devoted to how a magnet attracts iron. Language remains a mix of modern slang and older English. (*Centre* is used twice, and several "sort-of's.") The author has discovered the Navy, but has ranks mixed up with Commanders bossing Captains and Task Force Commanders riding Destroyers when Cruisers are part of the flotilla. A "helpful" editor may have transformed a British Commodore into a Commander, but the boss sailor in most task groups usually always rides the biggest thing around. (The accommodations are better...) Except for the boo-boo above, I'd call this author "Navy Nick." There is a change in the "look and feel" from the last few episodes.

There was no gunplay in the last story, but in this one, Tom keeps an automatic in his desk. He also does state that he wants to "heartily smite" his erstwhile employer when the sot puts his own welfare ahead of a sub full of suffocating sailors. Emphasis is still, mainly on finances and money troubles. (After all, we are well into the Great Depression.) This is a tale where the hostile takeover is the weapon of choice for the bad guys. The other item of attitude has to do with inane behavior. Tom fires an employee for theft. The guy comes back, steals *again*, drugs Tom, sets a fire, and nearly causes a death. Tom says he will take him back (as an employee) "if he turns over a new leaf after he gets out of prison." Go figure. Mary goes all "clinging vine" with the old "Oh, Tom! What *will* we do?" routine. In previous tomes she was "plucky." Tom also has mood swings reminiscent of #18 *Aerial Warship* (another story where the Navy, finances and "padding" play major roles.) He is sarcastic and sneering at the beginning of the story. Maybe he knows that being drugged, drowned, electrocuted, burned and assaulted is in his future during this tale. I know it would make *me* cranky...

It has previously been *de rigueur* for Tom to "rescue" someone, *anyone*, at least once per episode. In this tome, he saves both Mr. Damon, and an entire submarine full of Navy sailors, including his wife's cousin.

Errata: There is a running gag throughout this series. Mr. Damon's home keeps flip-flopping between *Waterfield* and *Waterford*, NY. Sometimes it is in neither, and several times in both places, at once. This is partly due to the enforced poor communication amongst the many ghostwriters at G&D that contributed to this series.

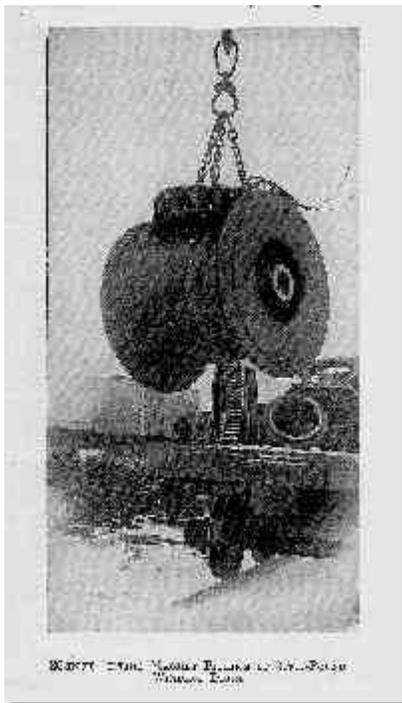
There are now 4 distinct categories. For the 1st time since *House on Wheels*, in this tome Mr. D's home *is not specified*.

The tally for 35 volumes, to date is:

Waterfield-16, Both places-2, Waterford-10, and Neither place-7.

Typos and malapropisms were nonexistent. Nothing jumped out at me.

Tom now keeps his valuable plans and models in a simple filing cabinet. (Big cabinet, small models?) Previous tomes had these valuata stored either in the *Chest of Secrets* (See Vol # 28) or a special vault constructed in the following story, *Airline Express*. The *Chest* isn't all that secure, as Tom doesn't even think of doing something as simple as lag-bolting it into the floor of the building. He pays for it later when his plans come up missing. My gun safe is more secure...



Engineering and Science, Fact vs. Fantasy

The *Giant Magnet* is designed to lift "many thousands of tons." Let's say we use short tons (2000#) to give Ole Tom the benefit of the doubt. A thousand tons is *two million* pounds. Some high volume scrap yards in 2005 can process as much as a million pounds of metal in a single work day. Lifting all that mass in one shot? Somebody has slipped a decimal point, by several places. Tom's improvements are usually 30 to 150% bigger and better than current tech, not a thousand times. This one's a stretch!

OSHA (not invented for another 37 years) would have a field day in Tom's lab. He works alone at midnight in a tank of water that has no emergency exit provision and submerges a device that operates on 2500VDC with questionable insulation. He then goes swimming, albeit accidentally. Scary!

The *Wonder Book of Knowledge*, my resource for all things scientific in the early 1900's indicated a large German commerce carrier submarine was built in 1916 that had an overall length of 315 ft and a gross weight of 701 tons. It could carry another 1000 tons of cargo, making it a pretty respectable "hole in the water." A wreck of this size would have made a suitable target for a *Giant Magnet*, but it's unlikely even a Tom Swift could have been able to raise something of this size in one chunk, even with two magnets.



Legalities: Tom *hijacks* the barges that are being used to raise a commercial wreck. This is accomplished (albeit for a righteous cause) with violence and threats over the objections of the rightful owner. I'm not a sea-lawyer, but this sounds suspiciously like *piracy*. The question begs as to whether the requirement to render aid in an emergency overrides the above criminal activity. In any case, Tom and Koku would be up for a couple of counts of felonious assault, in a real world.

Having the Marines storm the boat and commander it is another issue that I cannot address from a legal standpoint, except that I have learned that The Men With The Black Hoods and Machine Guns Are *Always* Right...

Geography: We have a new large city on a large river that empties into the Atlantic Ocean. It is called Harwich and has a sub base. This may possibly be Portsmouth Naval Shipyard, in New Hampshire. Between 1917 and 1941, thirty-three undersea vessels were constructed there including the famous *Squalus*.

There is also a real *Turtle Bay*. But the only *Turtle Bay* I could find with a *Map Point* search is near *Houston, TX*. A sea-side resort town is named *Saltair*. (The author was stretching on that one-almost as far as some of my puns...)

Shopton, previously a "small city," is back to being a "small village." Ned lives somewhere on the main street.

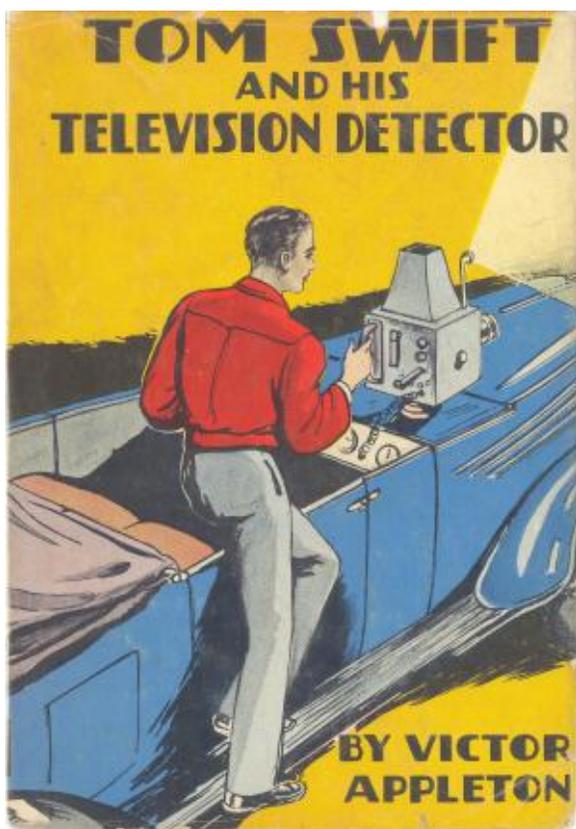
JP Karenko, 11/18/05

#36. Tom Swift and his Television Detector (1933)

Or, Trailing the Secret Plotters

Review by JP Karenko, March 2005

(Bottom picture of Grosset & Dunlap cover was sent to me by Mark Snyder. Thanks again, Mark!)



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

The book opens with Ned Newton working on "small, but complicated mechanism." Ultimately, we find it is a "pocket wireless sender" to be used to communicate via a cipher code if/when one of the chums is in trouble. He proposes to Tom that a means of seeing through brick walls would be invaluable in "finding criminals and anyone who might be kidnapped." Tom has other things on his mind, and pooh-poohs the idea.

It seems that a secret vault, located below his lab and protected by double-locks and alarms has been penetrated, and a small wooden box containing the formula for a deadly war gas has been stolen. Tom must recover the formula before it can be used to cause death & destruction at home and abroad.

It is learned that the formula was purloined by a nefarious foreigner who goes by the moniker "The Leopard." He leaves three muddy thumbprints as a calling card whenever he works his evil deeds, and seems to be able to come and go whenever he pleases, in spite of locks, alarms, and watchmen. He was even seen to appear to fly over a fifteen foot tall electrified fence.

In short, Ned's worst fears are realized when he is captured and held as ransom against Tom finishing his detector and using it to locate the Leopard and the stolen formula.

Along the way, Tom & Ned are accosted by not one, but two bearded (-they are *always* bearded...) spies and anarchists. They suffer hardships and solve technical mysteries that threaten the project's completion. Ned is able to contact Tom with his pocket wireless, and send the secret code.

Cast of Characters (More or less, in order of appearance)

Ned Newton-Chum & constant companion of Tom, currently Financial Manager of *Swift Construction Company*. In spite of this high office, he seems to have lots of time to go gallivanting on adventures with Tom.

Tom Swift--Intrepid Inventor, Hero, and wedded to love interest, the former Miss Mary Nestor.

Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat unsophisticated mental facilities. Antagonist and rival of Eradicate.

Mr. Korbis Alhazar--Inventor of an "instantaneous and deadly" poison gas "more dangerous than TNT." Passing mention only. Does not appear in the story.

Midnite Masked Marauder--One of many nefarious no-good-niks that seem to be able to roam the grounds of *Swift Construction*, in spite of guards, gates, alarms and electric fences.

Perkfield--NFN or description. Gate guard at SCC.

Eradicate, A.K.A. Rad--Aged stereotypical Negro manservant given over to the ravages of advanced age (Rheumatism and failing eyesight, among others.) Constant antagonist of Koku. Described as " feeble, eccentric and tottering." **Boomerang**, Rad's mule, is mentioned for the first time in quite a while. It is noted that he had passed on, some years previously, and is remembered fondly.

Mrs. Mary (Nestor) Swift--Love interest and radiant bride of Tom. Plucky, courageous, intelligent but in this story, merely Suzy Homemaker. Cameo appearance, late in story.

Barton "Bart" Swift--Tom's aged and infirm father. In this episode, he only is mentioned in passing, and plays no part in the story. Now being attended full-time by Eradicate Sampson.

Martin--NLN or description. *SCC* go-fer.

The Bearded Baddie--Later determined to be **Argad Metomsix**, A.K.A. "**The Leopard**" or "**Twisting Foot**"- Evil agent of some unspecified foreign (Asian or European) power. Highly educated, master locksmith, mechanic, athlete and spy. Outstanding physical characteristic(s) are a large, strong build, a bushy black beard and apparent ability to fly without wings. (Actually, he is an Olympic-class pole vaulter.)

South Gate Sam--No description or real name given. Watchman at the south end of the SCC grounds. Tends a tomato patch that seems to distract him from spotting the comings and goings of The Leopard, above.

Mr. Wakefield Damon--Elderly & eccentric adventurer and traveling companion of Tom & Ned, whose main purpose in life seems to be blessing everybody and everything near his person. In this tome, he is apparently an avid, if unskilled fisherman. His wife is again out of town, and he is off the leash and running wild, once more.

Mr. Benson Banlot--A man of "ordinary build." Special Agent of the *United States Secret Service*, in charge of rooting out, capturing and deporting anarchists, terrorists and other undesirable foreign-based elements. Also willing & able to arrest local crooks, when the opportunity presents itself. Carries a blue and gold badge.

Mr. Alex Kalhofski--Evil agent of some unnamed foreign power. Quintessential anarchist type: Outstanding physical characteristic(s) are: Wild-eyed, skinny, and with bushy red hair & beard. Dedicated to bringing the government of the United States to ruin. Principal quarry of Benson Banlot.

Mrs Damon--NFN or description. Arrives home early and puts damper on Mr. D's fishing trip.

Jim Parkman--No description. Shopton fish monger. Makes arrangements with Mr. D for him to have a successful fishing trip by "catching" some prime trout at his shop.

Larsen & Dubfold--Swift Construction "muscle." A cut above common thugs, these fine folks speak proper English, are clean-cut, and use their bulk in the service of the good guys.

Miss Helen Morton--Love interest of Ned Newton. On "short list" to be married to Ned. Cameo appearance, late in story.

Leopard's Whelps--Three of the most stereotypical "thugs" ever captured on paper. They are unnamed and proof that (at least in the gangster world) muscle times intellect equals a constant. Given over to the frequent use of the word "youse." This makes one surmise they may hail from either one of the Five Boroughs or possibly "Joisey." The only thing that would have made their stereotype complete is snap-brim hats, striped shirts and black Lone Ranger-style masks. Think "Beagle Boys" from Scrooge McDuck Comics. I'd call them "Curly, Larry and Moe" for all their effectiveness as henchmen.

Major Inventions

Tom Swift almost had to be cajoled and begged by Ned to invent something major in this book. The *Television Detector* is a device that leverages parts of the *Photo Telephone* and *Talking Pictures* machines. It will allow remote viewing through brick or other solid walls at a distance. The device uses a variable focusing device similar to the one on the *Electric Rifle* and has a range of up to several miles. A Radium tube and a secret projector are used to illuminate objects viewed through prisms on a special double-anode high vacuum Cathode Ray Tube. The Radium illuminator allows viewing in total darkness in full color at an included angle of 45 degrees in front of the device. No sound reception is possible in this model, but Our Intrepid Inventor has some ideas for future improvements.

The pocket wireless sender, an AC/DC radio transceiver is about the size of a large cigarette case. It has a 10 mile range, uses "short wave" technology and plays a key role in the rescue of Ned from his kidnapers.

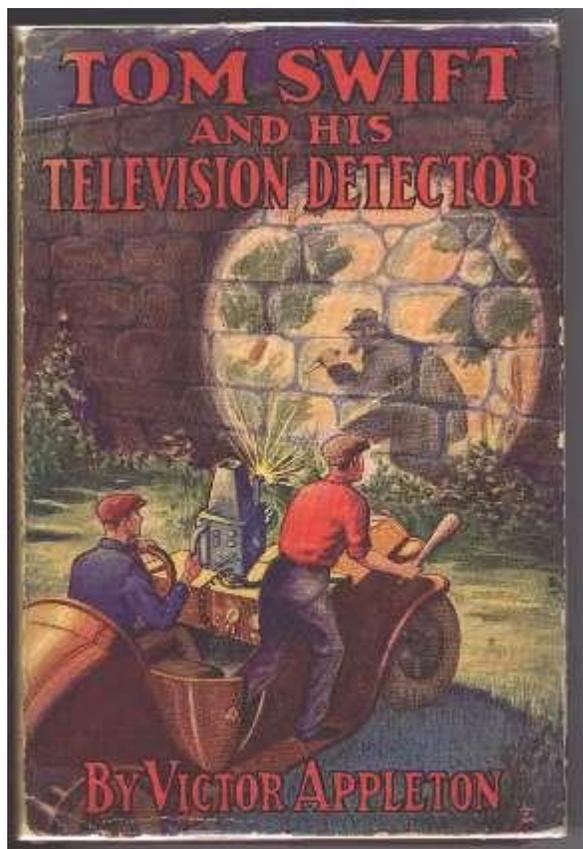
The Newton Secret Code allows Tom & Ned to converse in private via Morse dots & dashes, using the pocket wireless sender. Code is needed, since anyone with a similar device could "listen in." It is a very complex and inefficient code with many nonsense filler/null characters used.

Finally, there is the "Human Assimilator of Congealed Delights." I'll leave that one up to the imagination of the reader.

Commentary on Society, Attitudes, Environment & Errata

Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted. It also has given me a grasp of just how technologically and culturally unsophisticated the average reader was in the early 1900's.

Attitudes and Prejudices: Some *clues* (although that term is no longer used) that were detected as to the author of this tale: This tale reeks with significant *foreboding*, (bordering on clairvoyance,) to prepare for



events that make the plot come out. Ned makes no less than 6 references to the following: "Maybe we *really ought to* finish that secret code and build a *TV Detector* **just in case** *somebody* gets kidnapped and we need it to rescue them." (Then, he gets kidnapped-D'oh!)

Emphasis is no longer on finances and money troubles, as in the previous few tales. This is an ordinary cops & robbers / spy story. The attitude shift goes along with the statement that "there is a great unrest in parts of Europe." It's 1932, and a certain Austrian paperhanger with a toothbrush moustache is now in charge of a thoroughly aroused and angry Germany.

Some techno-things are actually described correctly. (See **Fact vs. Fantasy**, below,) but the author's engineering knowledge is iffy. There is a *large* amount of padding in the story that boosts the page count. Language is wholly modern & slang. No older English was used except "jigger" (used eight times) and Ned swearing by "Jinx" rather than Tom's "Jove." The language used definitely points at Harriet Stratemeyer's touch, but the story line seems 'way too rough for her to have penned it. Kidnapping, knockout drugs, guns and bombs play significant parts in the plot. This, along with an intimate

familiarity with several previous tales (*Airline Express* and *Talking Pictures*) make me think of this author as "Navy Nick." I'll hang responsibility for it and the other two stories mentioned above, on him.

Firearms have been utilized in other stories, but usually only for intimidation value during break-ins. No one gets shot, except critters and, possibly rampaging natives. In this tale, Tom keeps an automatic in his desk. It's also the *second* story that I have read which includes an actual firefight, and the first with an actual gunshot injury & fatality during the climactic capture of the bad guys. (pp, 210-211) Normally, any violence in these stories is limited to Koku busting a few heads, or Tom getting knocked out or drugged. I guess G-Men aren't as finicky about warning shots as Tom is.

Finally, if any one of the average bad-guys in these stories had any familiarity with a safety razor, they would know that being clean-shaven was a perfect disguise. Beards (and being "foreign") seem to be the characteristic distinguishing marks of the nemeses in these stories.

Errata: There is a running gag throughout this series. Mr. Damon's home keeps flip-flopping between Waterfield and Waterford, NY. Sometimes it is in neither, and several times in both places, at once. This is partly due to the enforced poor communication amongst the many ghostwriters at G&D that contributed to this series.

There are now 4 distinct categories. For the 1st time in a while, in this tome, Mr. D's home **flips** to **Waterfield**.

The tally for 36 volumes, to date is:

Waterfield-17, Both places-2, Waterford-10, and Neither place-7.

Typos and malapropisms were nonexistent. Nothing jumped out at me.

Engineering and Science, Fact vs. Fantasy: It's amazing how far around the circle technology has come in 90 years. In July of 2004, it was announced that a wall-penetrating wide-band radar remote viewing device was being developed for the military and law enforcement use. A prototype device called the RADAR Flashlight, developed at the Georgia Tech Research Institute (GTRI), can detect a human's presence through doors and walls up to 8 inches thick.

Another announcement (Jan 2005) revealed a device more along the lines of a real-world Tom Swift, invention. An excerpt is below.

Hurtubise says invention sees through walls-BayToday.ca exclusive



*By Phil Novak BayToday.ca
Sunday, January 16, 2005*

Troy Hurtubise has done the seemingly impossible with his newest invention and defied all known rules of physics, he says. The Angel Light-Hurtubise claims the concept came to him in a recurring dream-can reportedly see through walls, as if there was no barrier at all. An unpleasant side effect of this viewing device is that the energy used to make it work is injurious and/or fatal to living organisms. I guess that means the girls'

locker rooms at the local high schools are safe for the moment-or perhaps very unsafe...

(This link was OK as of 11/2005)

Wikipedia, "the free on-line encyclopedia," takes issue with the claims above, at the following site: http://en.wikipedia.org/wiki/Troy_Hurtubise

They do not lend credence to the claims made by Hurtubise regarding this device, as excerpted, here:

Angel Light: Most recently, Hurtubise has designed the Angel Light, a large device that he claims can see through walls, see into flesh, detect radar-resistant aircraft, and disable electronic devices. Hurtubise claims that the design for the Angel Light came to him in a series of three dreams, and that he was able to build it from memory, with no schematic.

The Angel Light is tubular in shape, several feet long, and is constructed in three units. The "centrifuge" unit, contains logic devices, black, white, red and fluorescent light sources, as well as seven industrial lasers. It is unknown whether the centrifuge unit includes an actual centrifuge. The "deflector grid" unit is made up of a circular piece of optical glass, a microwave unit, and plasma combined with carbon dioxide. The third, unnamed unit contains eight plasma light rods, CO2 charges, industrial magnets, 108 mirrors, eight ionization cells, industrial lights, and a variety of other electronics.

Hurtubise is allegedly receiving undocumented and secret assistance, both financial and technical, from unnamed workers at MIT, the French government, and the somehow-anonymous former head of Saudi counter-intelligence to construct and explore the device's properties. Through these channels, he claims to have acquired a sample of the stealth radar-resistant panelling used on the U.S. Comanche helicopter.

Much of the details of Hurtubise's claims seem either incorrect or exaggerated, and because of this, it is worth noting that none of the spectacular capabilities of the Angel Light have ever been photographed, even though Hurtubise has allowed media members to photograph the device itself, and the light it emits while operating.

Although Hurtubise's prior technologies have been demonstrated to have genuine value, both financially and scientifically, his extraordinary claims about the capabilities of this device (particularly medical claims) have prompted skeptics to label Hurtubise a charlatan. Although Hurtubise has publically offered a cash reward for proof that his device doesn't work, he has not been so forthcoming with basic evidence that it actually does work.

There is currently (20 September 2005) no indication that Hurtubise is lying, however Hurtubise's claims are so unusual that it is not unreasonable for skepticism to follow such claims.

With the exception of **God Light**, Mr. Hurtubise's other inventions are treated more charitably.

The "Pocket Wireless" is the FRS radio or cell phone that we take for granted today. That it had a 10 mile range in a package little larger than a "cigarette case" was stupendous engineering for the time. All this

without the yards-long antennas required by radios of the day, and no transistors or integrated circuits, to boot. With a tube amplifier that little box must have been the forerunner of "Hot Pockets" if allowed to stay in Ned's slacks while operating.

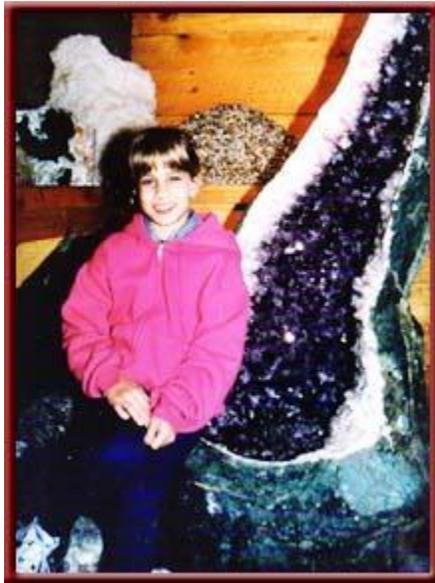


The dry cell(s) that powered it had to be "Pink Bunny Specials," too.

(Pretentious note to future readers: The pink rabbit is the trademark of a company that sells especially long-lasting chemical/electrical conversion devices.) Powering tube radios with batteries was indeed done at the time, but the batteries (both "A" and "B" varieties) were much bigger than what could be carried in a pocket. It's also interesting that the set made no noise. The pop/crack/sizzle and clang of the typical spark gap radio (which prompted Tom to invent a "silent" one in the next book) seemed absent. If it were the usual noisy spark-gap type, Ned would have been busted the first time he tried to use it.

It is quite apparent that the dangerous nature of Radium was unknown to the author(s) of this story at the time it was written. Marie Curie, the ground-breaking physicist who pioneered advances in radiology would not succumb to Radium-induced Leukemia until the summer following this story's first printing. In a real world, Tom and Ned would be quickly poisoned by contact with this dangerous element, especially in the absence of even the rudimentary safety precautions used during handling and use in that day. While getting a visible image on a Selenium plate would have been possible, "living color" as was described, would have taken much more equipment. The Selenium image would be green monotone, like today's night vision devices.

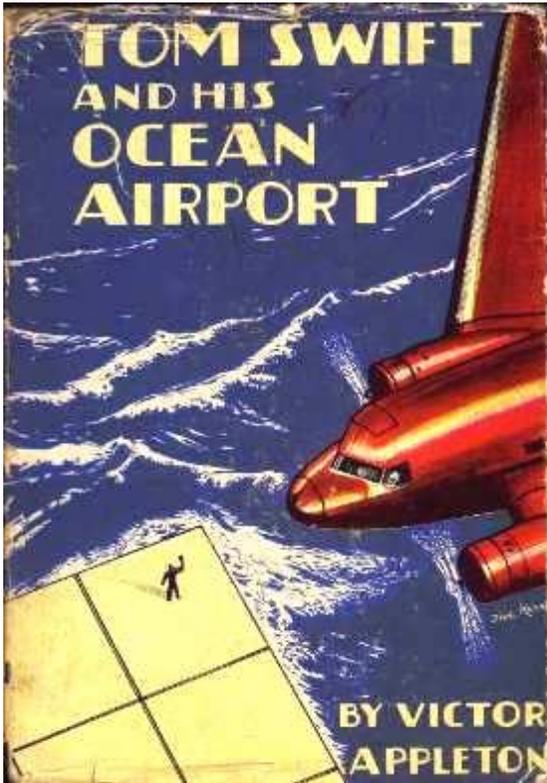
Geography: "Crystal Cave" is said to be located about 5 miles from Shopton. There is a commercial show cave near Pottersville, NY, the Natural Stone Bridge & Caves. NSB is about 25 minutes from Lake George, off route I-87 and may be what the author used as a template. The Geodes found there in abundance surely would qualify as "crystal," and it's in the right neighborhood.



There is a city of Chester near Shopton, noted in *Diamond Makers*, and a Chesterport in *House on Wheels*. Interestingly, in the New York of our universe, there is a Chestertown, just down the road a ways from *Crystal/Natural Stone Bridge Caves*.

#37. Tom Swift and his Ocean Airport (1934) (Review 1)

Or, Foiling the Haargolanders



Summary: No official summary was ever provided with any of the old Tom Swift books. However, the plot can be summed up as follows:

A friend of Tom Swift's was thought to have been murdered over the Atlantic Ocean in an attempt at circling the globe. Tom, partly in memorial and partly because of a need, decides to build a large floating airport out in the middle of the ocean.

To build such an airport requires a very special kind of wood. This wood, called talcap, is imported from the mythical country of Haargoland. There is some trouble getting the wood, but at last Tom gets his wood, figures everything is all right, and goes out to sea to build his airport.

After the airport is built, however, the Haargoland navy shows up and claims the airport for Haargoland, claiming that Tom had no right to take the wood in the first place. Tom then is forced to use his new "soundless wireless" to contact the U. S. Government, which promptly dispatches a

large plane and a Navy vessel to the scene.

The Navy vessel, arriving first, promptly forces the Haargolanders to surrender. Before the United States government can take official responsibility for the airbase, however, certain ceremonies have to take place; the men who have to perform these ceremonies are on board the airplane, which gets trapped in a tremendous mid-Atlantic storm.

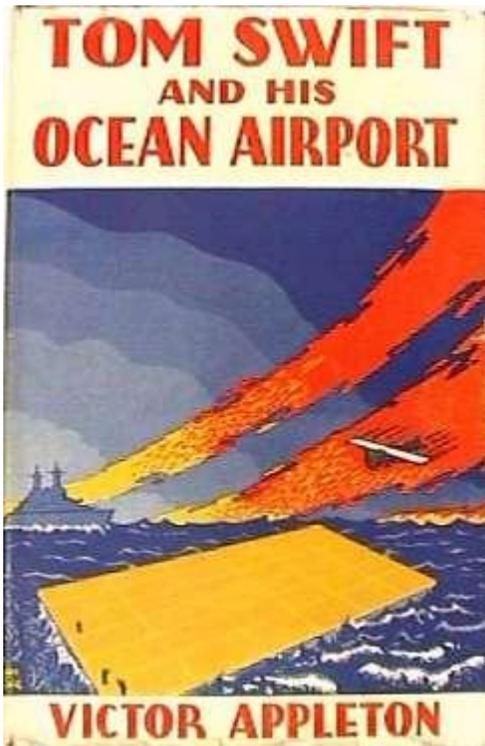
Can Tom Swift's Ocean Airport stand this ultimate test and save the planeload of diplomats? His Ocean Airport faces its ultimate test!

Major Inventions

There are two major inventions in this book -- the **soundless wireless** and the **Ocean Airport**. I'll discuss them as they were introduced in the book.

The **soundless wireless** is exactly what its name implies it to be -- a wireless (that is, a radio) that makes no noise. Offhand, this doesn't sound like a very great achievement (for those of you out there that are amateur radio operators, how much noise do Ham radios make?), but, according to Tom, the normal wireless is so loud as to "crack your eardrums". Can anyone verify this? Old wireless sets in the movies are always pictured as being silent, efficient monsters -- did they really make that much noise?

If they were as loud as Tom claimed, then a quiet wireless would be a nice thing to have -- especially if you wanted to send messages in secret, as Tom did. The invention would hardly be earth shattering, but it would definitely find its place. How he managed this feat is unknown. There are a few vague references to shortening tubes and things like that, but, as usual for his later inventions, no details are supplied.



It is needless for me to say that this invention has found its place in modern life -- modern radio senders are not noisy, loud or irritating. I, to be quite honest, never knew that they were loud, noisy or irritating in the first place...

The other important invention in this book is the **Ocean Airport**. The Ocean Airport is exactly what its name implies -- it is an airport that floats around in the middle of the ocean. According to Tom, this invention was needed to give pilots a safe haven in the middle of the ocean in case there was a large storm or in case the pilot was having engine trouble. The airport could also be used as an important mid-ocean refueling station -- according to Tom, it was situated 2,000 miles out of the Azores and 2,000 miles away from the nearest land.

The Airport was not one large, prefabricated piece, as you can see from the dustjacket. What Tom did was make 36 small perfectly square pieces that, when Tom's giant magnet was activated, would come together to form one large airport. The airport itself was actually manufactured in the middle of the ocean -- the supplies were brought in on board an old Navy vessel and Tom assembled it on-site.

Talcap wood was needed to make the ocean buoyant enough to stay afloat on the ocean. It seemed to possess some rather interesting properties -- it was light, strong, very buoyant, and only grew in revolution-prone Central American countries.

The reason the airport had to be assembled in discreet sections was because the airport was so large that, if it consisted of one large piece, it would be destroyed by the first gale to come its way. This I can heartily believe -- any old, grizzled sailor can tell story after story about the huge force a storm at sea can pack.

It seems that Tom Swift does not have a monopoly on this idea. In the Ted Scott book "Rescued in the Clouds", it mentions the idea of an "ocean airport" and demonstrates the great need for one. Evidently this was a common idea at the time, and quite necessary too -- as dangerous as crossing the ocean was, it would definitely help to have stopping place somewhere.

The great Ocean Airport, while being quite feasible, was, as we all know, never built. The reason is quite simple: aerospace technology has progressed far beyond what anyone in the 1930's would have believed, and nowadays a plane that doesn't have enough range to cross the ocean with some fuel to spare shouldn't be attempting the flight in the first place. Storms that use to be so devastating to earlier pilots can now be entirely missed simply by flying a few thousand feet above the storm. The ocean, for the most part, has been licked.

Update! Some time ago I received an e-mail from someone regarding the soundless wireless. I thought it was very interesting, so after getting permission to post it I am posting it here. Here it is!

I ran across your page while doing some research. I have found memories of the Tom Swift books. I believe from a third or fourth printing though. Anyway, I had some info for you.

Re then "Soundless Wireless" you reference to, the original radio transmitters used a spark-gap technology to send Morse code. Each time the key was depressed a spark of electricity was fired across a measured gap between two electrodes. This created "Hertz" waves that were possible to pick up at a distance.

The original receivers (coherers) used iron filings in a tube. These would realign each time a transmission was received. Then a hammer would bang the tube with the filings to unalign them again.

Both the spark (which is like a miniature bolt of lightning) and the hammer rearranging the iron filings could have been noisy. A powerful enough discharge spark to transmit a long distance could have been very noisy.

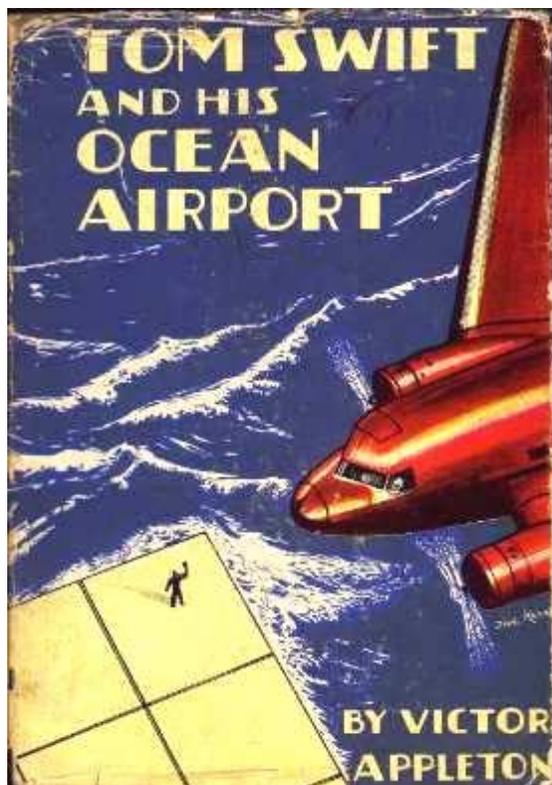
Anyway, this may be the origin of Tom ingenious "Soundless Wireless".

Thought you would like to know.

#37. Tom Swift and His Ocean Airport (1934) (Review 2)

or, Foiling the Haargolandiers

Review by JP Karenko, January 2006



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

"Mayday! Mayday!! I am going down!!!" The cry for help over the ether heralds the beginning of a new adventure for Tom Swift. A boyhood chum, one Jerry Mason, is on a solo record-setting distance crossing of the Atlantic, a la Charles Lindbergh, but by a longer route. He is being forced down by a rival flyer, who is taking a tom-cat's approach to competitors-that is, "kill 'em all." If only there were a place to land...

Tom decides that maybe an artificial island airport might have saved the day. He goes about designing one that can come apart into smaller sections in a controlled fashion instead of breaking up should a storm threaten it. It is to be made from a light but strong wood called Talcap. This material is only found in a certain South American Republic. Unfortunately, Tom finds out that a Presidente in the palace is NOT worth two in the jungle. A regime change after the wood is purchased puts the entire project (and Tom & Co.)

at risk. It is said that "an *honest* politician is one who *stays* bought." These boys *aren't* honest, and they play *rough*.

Cast of Characters (More or less in order of appearance)

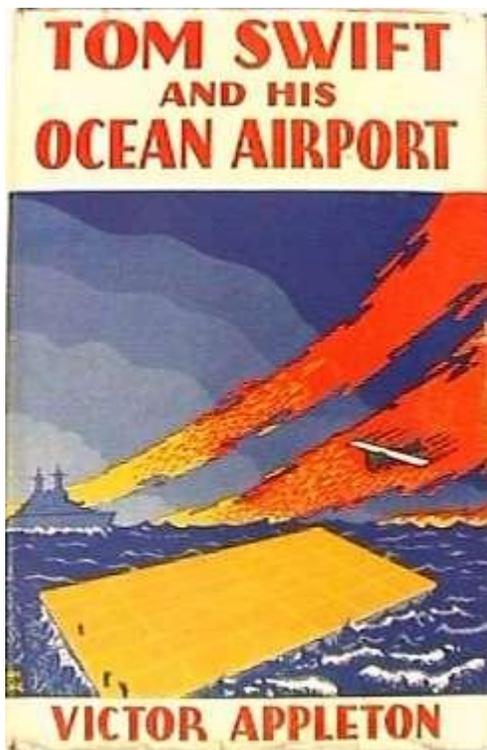
Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical

Ned Newton--Chum & companion of Tom. His description is never given. He continues in his position as Swifts' financial advisor and CFO (Treasurer) of *Swift Construction Company (SCC)*. In this tale, he repeatedly cautions Tom about a new hire, one Emil Gurg. Tom, as usual, ignores him.

Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited cognitive facilities. Described as "savage and only half-tame," he is antagonist and rival of Eradicate. In this episode, he has shrunk, and is only "a veritable giant." He continues as watchman & guard at SCC .

Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro manservant. He is now going deaf and is described as "aged, decrepit, wizened and shuffling." He remains faithful to the Swift family and helps out where he can. He is a constant rival and antagonist of giant Koku.

Gerald "Jerry" Mason--No description, other than "tall and young." Boyhood chum of Tom Swift, he resides "out West." An aviator determined to push the envelope of flight, he plans to fly the Atlantic non-stop in his monoplane the *Sallie Lou*.



Mechanical Mike--No name or description. Airport grease-monkey who delivers a message to Tom.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. Never fully described, in previous tales he was "portly" with a moustache and "tortoise-shell glasses." He is quite wealthy and on the board of Waterfield Bank. While he has an ongoing problem with travel conveyance trouble, in this tome, he doesn't manage to smash anything. Off the leash and running wild, as his wife is out of town. She spends a lot of time at her mother's and considering Mr. D was described as "elderly," she may be providing elder care.

Zebford Lang--No description. Generic bad guy. Unscrupulous and deadly. Rival of Jerry Mason, he forces Jerry down in mid-ocean, so he can be the first to cross the Atlantic by way of Portugal/Spain.

Airport Al--No name or description. Brings Tom news of conflict between Jerry and Zeb.

Emil Gurg, nee Gurganzuoli--Small, neatly dressed engineering assistant hired by Tom. Darkly tanned, with very white teeth and a "professional air," he ingratiates himself into the Swift organization.

Later found to be a spy/agent provocateur for the government of Haargoland.

South Gate Sam--Nameless and faceless Swift watchman, who admits Gurg to SCC after hours. That south entrance seems to be the weak spot in SCC's perimeter. In the previous episode, Sam was tending his tomato patch instead of watching the gate.

Tom's Secretary--No description. May be a Miss Mapes , previously introduced as in episode #34. Walk-on part.

Captain Blare, USN--Washington chair warmer. Wants Tom to build the airport as a military base.

Lt. Bradford, USN--Adjutant assigned to Tom as liaison with Washington.

Hargsander--NFN or description. California Amateur Radio operator contacted by Tom during wireless test.

Aircraft Al--NFN or description. Faceless SCC pilot/mechanic.

Senor Zaraft--Deposed Presidente of Haargoland. On the outside, trying to get in.

Senor Pocktal--Temporary Presidente of Haargoland. On the inside, but soon to be out.

Haargo Harry--NFN or description. Co-conspirator of Emil Gurg.

Capt. "Harry" Benson, USN--No description. Commander of *SS Whale*.

Seaman James Thurber, USN--No description. Navy rating injured during airport construction.

Mr. (Probably Lt. Cdr.) Turner, USN--NFN or description. XO of *SS Whale*.

Sailor Sal, USN--NFN or description. Navy rating. Bit part.

Lt. Hardy, USN--NFN or description. Bridge watch officer, *SS Whale*.

Commodore Lascado, NRH (Navy of the Republic of Haargoland) --NFN or description, other than "wearing much gold braid." Captain, *NRH Talcap*.

Lt. Zaldo, NRH--NFN or description, other than "wearing much gold lace." Commander, boarding party.

Lt. Manchez, NRH--NFN or description, engineer/pilot commanding prize crew of *SS Whale*.

Captain "Bob" Perkin, USN--NFN or description. Captain, *USN Hornet*.

Jack Bentley--No description. Friend of Jerry Mason.

Dinghy of Disgruntled Diplomats--Planeload of politicians, saved from a water landing by Tom's conveniently placed airport.

Major characters not appearing in this story:

Barton "Bart" Swift--Tom's aged father.

Mrs. Mary Nestor Swift--Radiant bride of Tom.

Mrs. Baggert--Housekeeper/surrogate Mother to Tom while he grew up.

Helen Morton--No description. Love interest of Ned Newton

Garrett Jackson--*Swift Construction* Works Manager/Superintendent.

As is usual lately, many of these characters (especially the ones introduced late in the story) do not rate any development or even a description. They are brought forth and discarded after they do their bits to make the story flow. The (hopefully humorous) alliterative names are my "inventions" to make reading these reviews a bit more fun.

Major Inventions

Talcap is a light, strong wood like Balsa, which only grows in Central/South America. The *Floating Airport* is comprised of 36 square segments, constructed from this wood, each 300ft on a side. They are laid out in a 6x6 grid. This results in a platform 1800ft on each edge. Each segment has an open grid construction to minimize the effect of wave action, a submerged weighted keel for stability and wireless-electric powered electromagnets to hold the segments together. The segments can be detached and separated during a storm, to minimize damage from waves. And each section has marker lights so they can be found if separated.

The Soundless Wireless also plays a major role in the story. This device is constructed in a manner that permits radio telegraphy without the usual Snap-Crackle-and-Bang of then current technology radio sets.

Commentary on Society, Attitudes, Environment & Errata

Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted. It also has given me a grasp of just how technologically and culturally unsophisticated the average reader was in the early 1900's.

Attitudes and Prejudices: Some *clews* (although that term is no longer used) that were detected as to the author of this tale: This tale reeks with the usual string of *coincidences* that are required to allow the story line to progress. There is also a lot of repetition to pad the text and raise the page count. The story also requires significant *foreboding*, (bordering on clairvoyance) to prepare for events that make the plot flow. The author's nautical and engineering knowledge is iffy, and many things are not described correctly. Language remains mostly modern with a few older British terms thrown in. The word "Jove" was sworn by three times and "throng" was used three times. (This is the first recurrence of throng since Episode #5 the *Electric Runabout*.)

Language in this tale is somewhat strange. Grammar is proper with only 1 each misspelling and malapropisms found. (See below.) A number of "\$64" words are used, almost as if the author spent some time looking for complex ways to say simple things. One example, is the Koku is said to speak "sententiously." **sen...ten...tious**, an adjective, is defined as:

Terse and energetic in expression; pithy.

Abounding in aphorisms.

Given to aphoristic utterances.

Abounding in pompous moralizing.

Given to pompous moralizing.

This term does not properly describe the language of a near illiterate giant who traditionally speaks mostly like a Hollywood Indian, and is generally limited to making statements like "Me break-um in pieces." Frankly, it sounds more like Our Hero...

The language used definitely points at Harriet Stratemeyer's touch, but the story line seems 'way too rough for her to have actually penned it. Tom gets burned, bombed, chased by sharks, captured, imprisoned and caught in a naval bombardment. About the only traditional hazards the author didn't pull out of the hat were the chloroform and electrocution. This is also the first tale where there are mass casualties as a part in the plot. This, might make me think of this author as "Navy Nick," except that whoever wrote it was woefully uninformed as to Navy traditions and operating procedures. I'd hang responsibility for it on Nick, but only tentatively.

Firearms have been utilized in other stories, but usually for intimidation value during break-ins. No one actually gets shot. This is the *third* story that I have read which includes an actual firefight. It is the first with wholesale injury & fatalities during the climactic naval battle with the bad guys. (pp, 187-189). Surprisingly, there is also no emphasis whatsoever on hard times or on finances and money troubles. This is 1934 and the Great Depression is still gripping the world by the throat. The Austrian paperhanger running the Reichstag in Berlin doesn't seem to be getting any press, either.

Fancy hats sell for \$5, and now a "government permit" is needed to make transcontinental or other record setting flight attempts.

Why Build This Airport? In a word, altruism. Tom, never was able to turn down the opportunity to rescue someone, *anyone*... He wants a "safe haven" for aviators, mid-ocean. Coincidentally, a floating US military presence (aircraft carriers were still a few years away) would be an added benefit. What this project cost and how the funds expended were recovered was not chronicled in the story. Apparently *Swift Construction*, previously in dire financial distress, has picked up much business again, as Tom seems willing to give the airport to "Uncle Sam," gratis.

Errata: There is a running gag throughout this series. Mr. Damon's home keeps flip-flopping between *Waterfield* and *Waterford*, NY. Sometimes it is in neither, and several times in both places, at once. This is partly due to the enforced poor communication amongst the many ghostwriters at G&D that contributed to this series.

There are now 4 distinct categories. In this tome, Mr. D's home *is not specified*.

The tally for 37 volumes, to date is:

***Waterfield*-17, *Both places*-2, *Waterford*-10, *Neither place*-7, *Not Specified*-8.**

A few typos and malapropisms reared their ugly heads for the first time in a long while. *Propellers* are found early on and on p27, the *sounding* wireless (*soundless*) is referenced. Ned sends the wrong Morse

code at the beginning of the story. He intends to send "SOS" dot-dot-dot, dash-dash-dash, dot-dot-dot. Instead, he sends "SIS" dot-dot-dot, dash-dash, dot-dot-dot.

.It has previously been *de rigueur* for Tom to "rescue" someone, *anyone*, at least once per episode. In this tome, he saves a Navy rating who gets a hand caught in the gears of a windlass/hoist. That this fellow did not suffer major damage to his limb is fantastic, and that Tom now has surgical skills and is able to doctor the injury is even *more* fantastic. Where is the ship's Corpsman? This is a Navy vessel and crew. It's woefully understaffed, if you ask me... He also saves a plane load of diplomats late in the tale. I'm not sure if this was worth the effort, though. (I have a low opinion of diplomats...)

The *Whale* (nee *Resolute*) has a "purser" on board that Tom goes to see. I think the proper Navy rating would be either a Chief Petty Officer (CPO), or maybe even a Senior CPO in the Quartermaster Corps. While decommissioned as a battle platform, the ship is still under the command of the US Navy. This further demonstrates this author's lack of knowledge re Things Nautical.



CPO (Quartermaster) Rank Flash (2005)

Renaming battleships was not a common practice, at least in the US Navy. Generally, when a name gets *changed*, it is for an entire *class* of ship. Exceptions did occur, such as in the USS *Narwhal* (Submarine # 17, later SS-17 in service from 1909-1922.) It was renamed *D-1* in 1911. Most times, "renaming" is actually *reusing* of a name, to replace a ship either lost in battle or one previously retired and being resurrected. Then, almost always, the name is used on a different class of boat. Renaming a battleship, no matter how obsolete, from *Resolute* to *Whale* sounds like an insult.

Engineering and Science, Fact vs. Fantasy

The Floating Airport Concept:

Flotation: Talcap sounds a lot like Balsa wood. Balsa is light, strong and grows only in the tropics. I believe it would have to be treated to stay waterproof for any length of time, and to make it unpalatable to sea-critters (worms and such.) I'm sure that sea-dwellers would consider it a tasty snack. No provision was made for things like runway lights, beacons, hangars, fuel tanks, maintenance/repair facilities or other amenities. This is just a big old floating dry spot. Any port in a storm beats drowning, I guess... (Where's that porta-potty???)

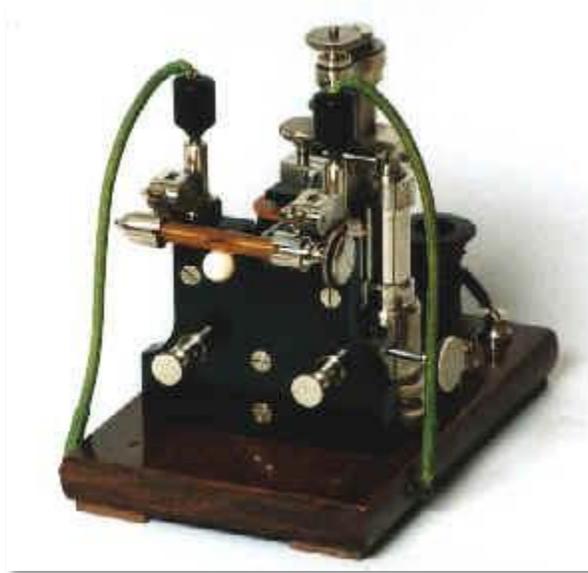
Some Assembly Required: The *Floating Airport* is comprised of 36 square segments, each 300ft on a side, and laid out in a 6x6 grid. This gives a platform 1800ft on each edge. Each segment has an open grid construction to minimize the effect of wave action, a submerged weighted keel for stability and wireless-electric powered electromagnets to hold the segments together. The wireless power system is practical, as demonstrated in the late 1890's by the inventor Nikolai Tesla, known as the "Father of Alternating Current."

The magnet arrangements that were used to hold the airport together the airport were not detailed, but for safety's sake, I'd design the array so it had some rigidity without the magnetic help. Machinery was notoriously unreliable in those days, and I can envision a planeload of VIP's in the drink because of an inopportune blown fuse.

The Soundless Wireless:

The noisy parts of early radio-telegraphy gear were the spark gap in the transmitter and the coherer in the receiver. How Tom goes about reducing the noise these components make is left to the imagination of the reader. The noise generated by the *spark gap* during transmitting is created by the arc superheating the air across the gap. Basically, we are creating lightning and a thunderclap in miniature form. The *coherer*, as invented by Branly and refined by Marconi, was essentially a go-no-go device. In the presence of a magnetic field created by an incoming signal, its particles "cohered" and lost most of their electrical resistance so that a battery derived electric current could be directed through the device and activate a telegraphic sounder. Then the coherence would be mechanically interrupted (the noisy part-they bang on the tube) while the system awaits the next pulse of magnetic energy. This was satisfactory for telegraphy only, and it would not respond to reception of sound-modulated electromagnetic waves.

An example of the Ducretet "exceptional precision coherer" is shown, below. Made of Maillechort alloy (copper+nickel+zinc), it was used principally by the Russian navy. (1904-1905) The tube containing the conductive filings is orange.



Almost as an aside, if Tom had been willing to "send" blind, without receiving, he would have reduced his noise output by at least 50% without any special equipment. Another thought had to do with military radio discipline. If I were to commit an act of war on the high seas, I'd want to make darn sure no one sent an SOS by monitoring the airwaves. The braid-encrusted political appointees in the Haargo Navy apparently didn't figure out that there might be a third transmitter on board the *Whale*. Their spy used his own set. Why could there not be another one in the hands of the good guys?

Tsunami: An item of engineering balderdash in this story, has to do with an underwater earthquake creating an EMP type disturbance powerful enough to knock out major ships' systems. A quick research on Google using Tsunami and EMP (Electro-Magnetic Pulse) turned up the following web document:

<http://www.tifac.org.in/do/pfc/pub/dec04.pdf>

It is a patent application for a "Tsunami Detector" that can be used as part of a warning system. It turns out that tsunamis *do* generate an EMP, but the magnitude is measured in **nano**-teslas, on the order of one ten-thousandth of a gauss. A typical "bar" magnet has a strength of about 100 gauss or about .001 tesla. A real-life pulse would probably make the ship's compass quiver for about as long as it was happening. It was said that the actual duration of the 2004/05 Indonesia tsunami earthquake was on the order of eight minutes.

Assuming the damage quoted above, was actually done, Tom has to work night and day to repair the damage. *Single-handedly?* Were there no ratings on board qualified to help? Or, for that matter, to do the work without Our Hero's expert direction?

If the Germans knew our Naval ships were such pushovers, (remember, it's 1934) Adolph & Co. would have been barking at the base of the Statue of Liberty *und ve would all be shpeakingk mit ze cherman akzent, ja wohl?*

Shark Tales: Tom punches a shark in the nose and drives it off, leaving a bloody trail in the water. When I first read this, I laughed. Sharks are tough critters and generally win any argument involving an unarmed human swimmer. The shark's bloody nose really is balderdash, but the following article leaped off the page while I was cruising the 'net.

Dad fights off sharks by Michael Madigan 13Dec05

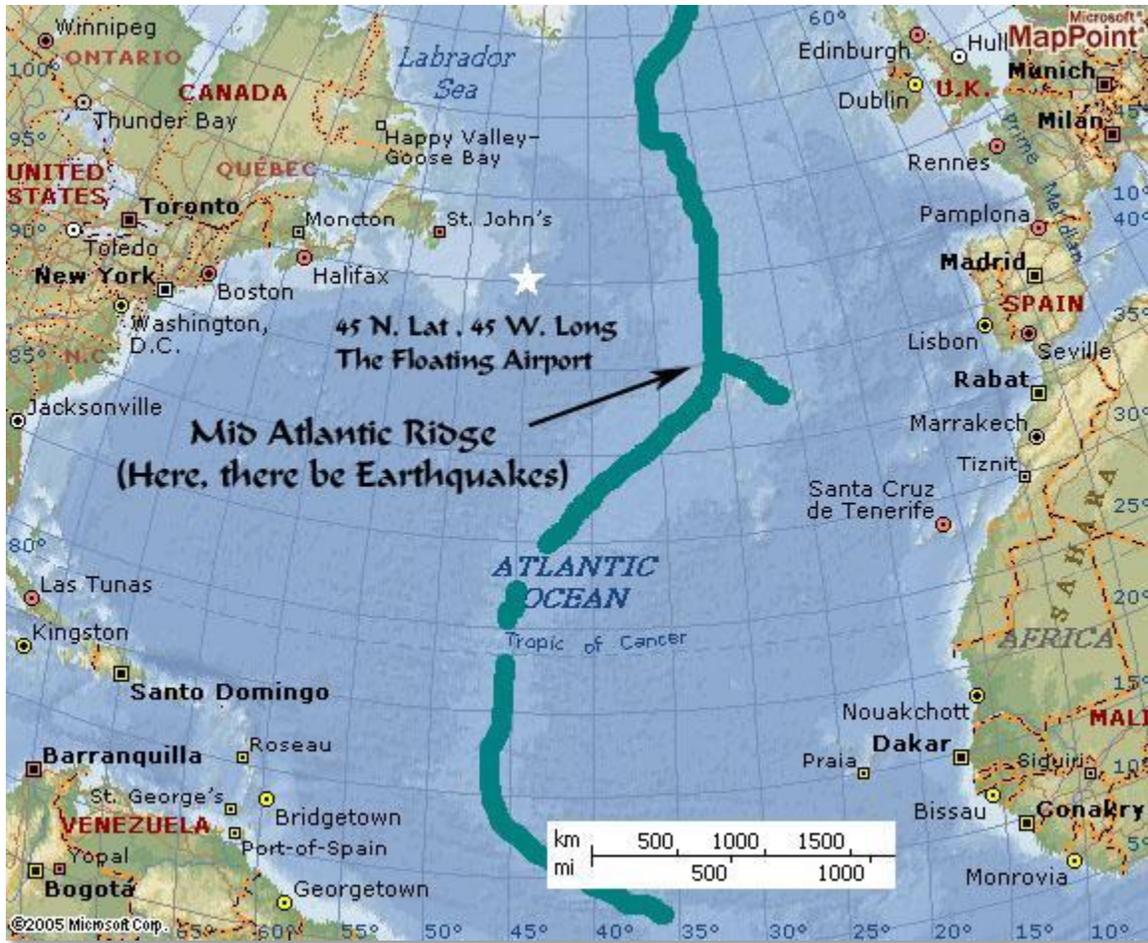
A MELBOURNE builder punched a shark as he fought off a pack of the predators attacking him and his 15-year-old son. Glenn Simpson, 44, lost a large chunk out of his right elbow and received 30 puncture holes in his arm during the desperate struggle...



Seems that we have to add "light heavyweight contender" to Tom's resume... It's unlikely the blood in the water was the shark's. Shark hide is rough as sandpaper and is leather tough. Most likely, Tom skinned his knuckles duking it out with the ferocious finned forager.

Geography: Shopton is back to being a "small city in an eastern state."

The *Floating Airport* is said to be anchored more or less at the coordinates 45deg N. Lat and 45deg W. Long. Coincidentally, this area is near the Mid-Atlantic Ridge, where two continental plates are separating. Sub-ocean earthquakes are indeed common, and this would lend credence to the events (but not the EMP) in the story. The tsunami created by this disturbance should have been felt in both Europe and the USA.



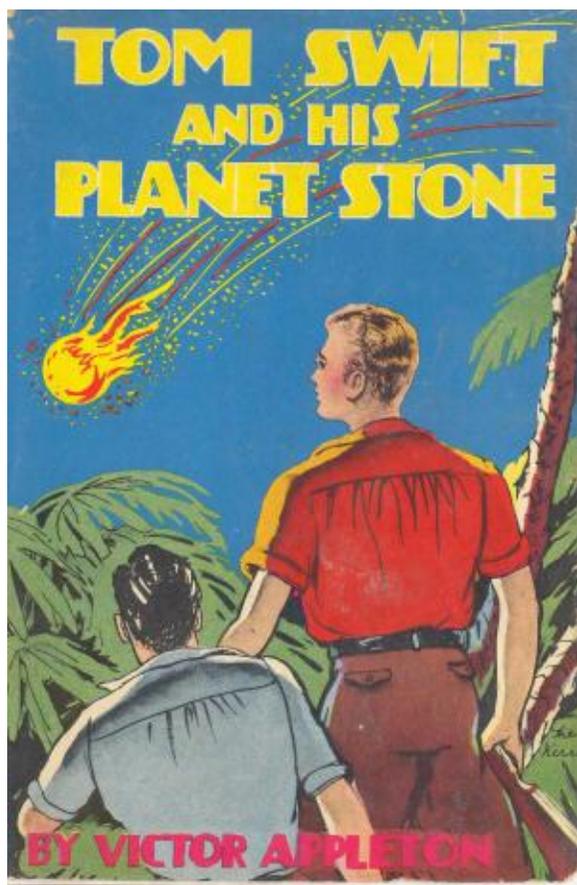
If Haargoland was a Central/South American country, their navy was quite brave, venturing into waters populated by both the British Fleet and German U-Boats.

JP Karenko, 01/04/06

#38. Tom Swift and His Planet Stone (1935)

or, Discovering The Secret Of Another World

Review by JP Karenko, May 2006



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

The story begins with Our Hero working on a new invention, the *Metalanthium Lamp*. This device is a *Star Trek*-type medical device that is used to heal the sick, raise the dead and otherwise cure incurable medical cases by bathing the patient in its' "mysterious, healing rays." Problem is, it doesn't work as planned, and Tom is stymied.

To add distraction to disappointment, Koku, Tom's faithful giant manservant, gets a letter from his long absent brother Tola. It seems that the twin giants are being recalled to their homeland to ascend to the throne as co-kings. Their younger (semi-evil) brother, Kosk, has died and the tribe requires new ruler(s) to govern them.

Tom is convinced to personally deliver the giants and attend the coronation. There is an added incentive that a large meteorite has fallen in Giant Land (later found to be named Ambolata.) This allows Tom to mix business with (dubious) pleasure, make the whole trip a tax write-off, and just perhaps find a solution to the problem with his

magic lantern...

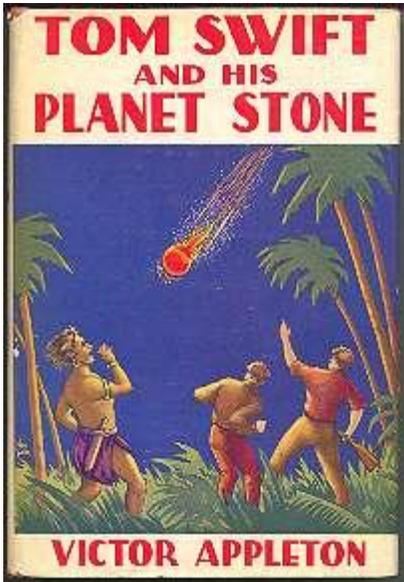
Developments follow that cause this tale to veer into the *Twilight Zone*. The remainder of the story is significantly more like fantasy than fiction.

The usual hazards of "life in the wild" are encountered, such as Tropical Tempests, Bad Beasties, Warring Wabawabas, Menacing Medicine Men and Dastardly Doctors. How these problems are resolved, you will have to locate a copy of the story to find out.

Cast of Characters (More or less in order of reference)

Wilson "Swatem" Goth--No actual description. American baseball's all-time home-run hero. He plays a secondary, but pivotal role as object of Tom's attention, late in the story.

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical.



Ned Newton--Chum & companion of Tom. His description is never given. He continues in his position as Swifts' financial advisor and CFO (In this tome, "Manager") of Swift *Construction Company (SCC)*.

Koku--Giant manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited cognitive facilities. Described as "savage and only half-tame," he is antagonist and rival of Eradicate. In this episode, he is "servant & guard" at *SCC*. He has been called home to reign with his brother Tola, as tribal king. Previously described as over 9ft tall, in this tale he is eye-to-eye with 6ft Tom while kneeling in front of him.

Tola--Currently residing in Europe and touring with a traveling circus. Twin brother of Koku.

Kosk--Younger (and shorter) brother of Koku & Tola. Now deceased. Usurper King of Ambolata. On the throne due to political machinations executed during *Tom Swift in Captivity*.

Ambolata Prime Minister--No name or description. Contacted Tola with word of Kosk's demise. Does not appear in the story.

Dr. Hardman Bane--A short, stocky man about forty years of age, of dark complexion and wearing a small moustache. Behind his glasses, are two black eyes. Allegedly, a medical doctor "affiliated with a large New York hospital." Later found to be a "charlatan, a quack" and a thief. Practices medicine without a license. All around baddie and principal nemesis in this tale.

Nonymous Night Watchman--Faceless and nameless Swift security guard, called to lock up the lab after Koku is poisoned.

Nubile Nurse Nancy--No name or description, except "pretty and young." Attending poisoned Koku at Shopton Hospital. Easily intimidated by Tom & other hospital staff.

Dr. Chester Chilton--A newcomer to Shopton, was exceptionally well educated and a very likeable person. Attending Koku.

Dr. Preston & other unnamed hospital staff--Extras. No significant parts in the story.

Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro manservant. Eradicate has now "become too old to be trusted on guard duty anymore." He is now going deaf and is described as having "white hair in a fringe and is bald on top." He remains faithful to Tom and helps out where he can. Constant

rival and antagonist of giant Koku. In this tale, he is said to be "soon to go to join his old mule Boomerang in the regions of the Beyond."

Jason--NLN or description. Tom's Shopton lab assistant & go-fer.

Dr. Morton--NFN or description. Hospital Chief of Staff. Prone to wild mood swings.

Red Faced O'Reilly--No real name or description. Shopton beat cop, called to arrest Tom for "practicing medicine without a license."

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. Never fully described. In previous tales he was "portly" with a moustache and "tortoise-shell glasses." We also have learned he cannot stand being near onions in any form. In this tome, we find he is "a *spy* little man," quite bald and wears a luxurious white wig. This figures prominently in the story line. He appears to be quite wealthy. Previously a victim of travel conveyance trouble, (he wrecks whatever he tries to pilot) in this tome, he does not smash anything.

Professor Edward Bayley--No description. Horticulturist acquaintance of Tom from an earlier unspecified adventure. Looking for work. Associated with (unnamed) State College.

Nelson & Jagger--NFN's or descriptions. Swift pilot/mechanics who run the *Sky-Train* "locomotive."

Kirkfold--NFN or description. Lab assistant taken along on the SA trip to Ambolata.

Janberry--NFN or description. Colored cook/steward in charge of care & feeding of the travelers. Supposedly an old timer Swift employee. May have been the (unnamed) steward in *Airline Express*. (Vol. #29) Portrayed even more stereotypically as a "Darkie" than even Rad. Rolls his eyes a lot when frightened.

Amo--Koku & Tola's "littler" brother. Selected to be king if he can prove he is worthy.

(Under) Chief Malata--No description. Generic ruler of a particular tribe and village.

Trio of Wabawaba Warriors--Sent to do single combat against Amo. Killed and beheaded for their pains.

Menagerie of Menacing Medicine Men--The real power behind the Ambolatan throne. Start a revolt that cause Tom & Co. to exit Ambolata, quickly and ungracefully.

The following major characters either have only casual mention or are not present in this episode.

Barton "Bart" Swift--Tom's aged father. On the dust jacket of *Chest of Secrets*, his appearance is remarkably like that of Robert E. Lee, but with glasses. Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. In this episode, he has only a walk-on part and plays no significant part in the story.

Mrs. Baggert--Majordomo & housekeeper of the Swift Manse. In charge of "several" maids. Mother figure, she loves Tom like a son. Walk-on part in this tale.

Mrs. Mary Nestor-Swift--Radiant bride of Tom. Described as a "very pretty young woman with flashing brown eyes, and a sweet trilling laugh." Blushes easily, especially around her Beau. In this tale, she only has a walk-on part, welcoming Tom home from his adventures in Giant Land.

Garrett Jackson--No description given, but is spry and fit for his age. (Original volumes described him as an "aged." Engineer.) *Swift Construction* Shop Manager/Superintendent. Does not appear.

Helen Morton--No description. Love interest of Ned Newton. In this tale, she does not appear or even rate mention.

As is usual lately, many of these characters (especially the ones introduced late in the story) do not rate any development or even a description. They are brought forth and discarded after they do their bits to make the story flow.

Major Inventions

The Metalanthium Lamp-Prisms, lenses, a glowing, hissing lamp, and a filter into which chemical compounds can be introduced. Said filter is made from a new metal called lanthium, and a screen made of borsidan. Lanthium is a soft metal used as a doping agent in manufacturing camera lenses. The name is derived from the Greek *lanthana* to lie hidden. Borsidan is a fanciful element that does not really exist.

Compounds ABC and XYZ-XYZ is a liquid solvent, highly toxic and a contact poison. ABC is the antidote, which can be administered by mouth or intravenously.

The Enhanced Sky Train-Now able to hover without visible means of support courtesy yet another new and improved "lifting gas that is safe as Helium, but much less expensive." A Laboratory Car, equipped for all things analytical, is first in line behind the powered "locomotive" aircraft. Now equipped with "wireless telephone."

Electric Handgun-Pocket-sized version of the famous Plasma Blaster. Has all the capabilities of its' bigger brother, plus concealability. (*The Brady Campaign To End Handgun Violence* would go nuts if this ever hit the market...)

Commentary on Society, Attitudes, Environment & Errata

Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted. It also has given me a grasp of just how technologically and culturally unsophisticated the average reader was in even the 1930's.

Attitudes and Prejudices: Some *clews* (although that term was *not* used in this story) that were detected as to the author of this tale: This tale *reeks* with the usual string of *coincidences* that are required to allow the story line to progress. The story also requires *foreboding*, in this case, literal *prophecy*, to prepare for events that make the plot flow. Characters are introduced and discarded with abandon. Many important players are not present or at best are relegated to walk-on parts. The author's engineering knowledge is minimal. (Her) knowledge and references to earlier inventions and events in the Tom Swift Universe are mostly accurate, although capabilities have been improved, such as the *Sky Train* being able to "hover," and there now being a handgun version of the *Electric Rifle*.

The look-and-feel of the text is very familiar and formulaic. The similarity in writing style and attitudes in the past few episodes points, in my judgment, to a consistent author. It is stated elsewhere that Harriet Stratemeyer gave up editing these tales to raise her children, and only picked up the pen again, after her father's demise. The choices of names and places in the tale (Parana-piranha, Hard-Man Bane for the antihero, Wilson-of sports equipment fame-ABC and others,) smacks of someone who is either distracted or perhaps out-of-practice and in a hurry to crank out a tale to make some quick cash.

Real-world events are mostly blissfully ignored in this tale. The Great Depression, winding down in America was still rampant in Europe. The 2nd World War is winding up with Germany well on its' way to Naziism. Neither event is mentioned. On the other hand, baseball-embodied by Wilson (check the brand-name on that ball you toss around with the kids) Goth-is very important to both Tom & Ned. Goth seems to be an amalgam of Babe Ruth ("The Sultan of Swat") and Lou Gehrig ("The Iron Horse.") Goth suffers from an incurable fatal disease that can only be healed by-guess who? Gehrig, was apparently not yet openly suffering from the ALS that took his life, and played his last full season in 1938, three years after this tale was published. He was diagnosed in 1939. While it's possible "Goth" was created as a tribute, it's scarier to think how prophetic the idea of a terminally ill baseball great was.

Interesting to also note that while concern was expressed for the welfare of lab animals (no vivisection was involved in Tom's experiments,) several were dispatched during the course of experiments with the Metalanthium Lamp. Others were killed when encountered in the jungle. There were also numerous native fatalities during the tribal war late in the tale.

Ambulances have gongs, not sirens. "Old-fashioned blood-letting" is still practiced in hospitals. (Shudder!) Automatic elevators are used in public buildings, but are slow and can be outraced by an athletic inventor, running up the stairs.

Koku and his countrymen now appear to be negroid, with "dark skin." Previously, Koku's appearance was described as "dusky" at most, and he is pictured in several book jackets as merely a very tall "white" man, possibly with no more than the bronze skin tone of many Amazon-area Indian tribes. In this tale, he and his people have been relegated to the status of *Tarzan*-style black savages, running around the jungle half-naked, poking spears into each other, pounding tom-toms and being frightened and amazed by the white man's juju when Mr. Damon doffs his wig. (Any medicine man worth his spirit rattle should know about wigs, as the fright-mask is a tool-of-the-trade in jungle-land "medicine.")

Errata: There is a running gag throughout this series. Mr. Damon's home keeps flip-flopping between *Waterfield* and *Waterford*, NY. Sometimes it is in neither, and several times in both places, at once. This is

partly due to the enforced poor communication amongst the many ghostwriters at G&D that contributed to this series.

There are now 4 distinct categories. In this tome Mr. D's home *is not mentioned*.

The tally for 38 volumes, to date is:

Waterfield-17, Both places-2, Waterford-10, and Neither Place-8.

Typos and malapropisms were infrequent. Either the editing improved, or the author's skills did. Since this was an e-book version, some errors may have been either corrected or others introduced during transcription. One in particular sounds like an "autocorrect" error. Prof. **Ed** Bailey is referred to as **Ted**, twice in the paragraph following his introduction. Spell check would pass this. A proofreader should not have.

It has previously been *de rigueur* for Tom to "rescue" someone, *anyone*, at least once per episode. In this tome, *he* follows the formula, saving Koku from poisoning, a native from a Jaguar, Prince Amo (yet another brother of Koku & Tola) from injury and finally, the famous baseball hero, Swatem Goth. Busy guy...

Engineering and Science, Fact vs. Fantasy

Metalanthium-Tom's Magic Lantern. Oh, the magic of science...Mysterious rays from the device can fix most anything that ails you. This device alone, if realized, would have made Tom's fortune and won a Nobel Prize (or several) for him. No details are given, except as noted, above. I could do an entire review about quack medicine in the 20th century-but as they say, "That's another story."

Compounds ABC and XYZ: XYZ is a "solvent," concocted by Tom. Highly toxic, hallucinogenic and causing a "mysterious" malady, up to and including coma and death, it also seems to have the power to induce prophetic dreams in the victim. Koku accurately predicts future events crucial to the story line as he lies near death in the Shopton hospital. In spite of the toxic nature of the liquid, it is stored in a glass container with a simple stopper and on a shelf where said container could be upset or broken. (OSHA would have had a field day and would go thru SCC like grease thru a goose...) In spite of its "mysterious" symptomology, an antidote to XYZ, the ABC solution, is available and on hand to save the day just before Koku expires. ABC is administered via mouth or injection, and reverses the effects of XYZ almost instantly. Lucky thing for Koku it was on hand...

Meteorites From Mars: It's 1935, and Orson Wells has not yet scared the living bejeebers out of a significant portion of the American public with his radio "documentary" of a Martian invasion in Grover's Mill, NJ. (Coincidentally only 39 miles as the space-rock flies from the Stratemeyer homestead in East Orange.) H.G. Wells' *War of the Worlds* is well known at this point, and in that story meteors containing life

from another planet (Mars) were said to have landed on Earth and sprouted horrors beyond imagination. Now, we can't have yet *another* Martian invasion, (that's plagiarism...) so the "life" in the *Planet Stone* will have to be beneficial, rather than inimical. Seeds, *viable* seeds, from another world travel for who knows how long through cold, airless space, and end up within reach of Our Hero. They are comfortably packaged in an insulated pocket buried in the center of a 1-ton chunk of Nickel-Iron. When they sprout, things Just Get Better. (Anybody remember *Day Of The Triffids*?)

Fast forward 60 years: Meteorite ALH84001 is being analyzed and behold! Fossilized "Martian bacteria" and crystallized "Martian atmosphere" are "discovered." ñOr at least that is what some of NASA's finest have concluded. The jury is still out in my book...Some of these guys change their expert opinions oftener than their underwear. Some really good theories also seem to evolve best in smoke-filled rooms that have the lingering aroma of burning hemp.

Tom's Rock Is A Crock? BTW, (By The Way) when this 1-ton chunk of near-molten iron (I'm being conservative-it took 8 giants, each with a 400# lift capability to transport this thing-that's 3200lbs.) landed, only Koku's kid-brother Amo was injured. Meteorites generally arrive one of two ways: They explode into celestial shotgun pellets and create devastation similar to the Winslow, AZ meteor crater, or they stay intact and dig a *deep* hole. Either way, a 1-ton rock falling from orbit is going to lay waste to a significant portion of real-estate. I think in real life, Tom & Co. would have been lucky to find a toasted grease spot, rather than a more or less whole, but critically injured giant prince. Also, what happened to his Royal Entourage??? Royalty rarely travels alone, even in the jungle.

Below is one of the best-known examples of an impact crater, The Barringer Crater in Winslow, AZ. The heavenly body that dug this hole is a wee bit bigger than Tom's Pet Rock, but I think you get my point. I want to be *elsewhere* when a *Planet Stone* arrives...



Photo courtesy of David Roddy, USGS

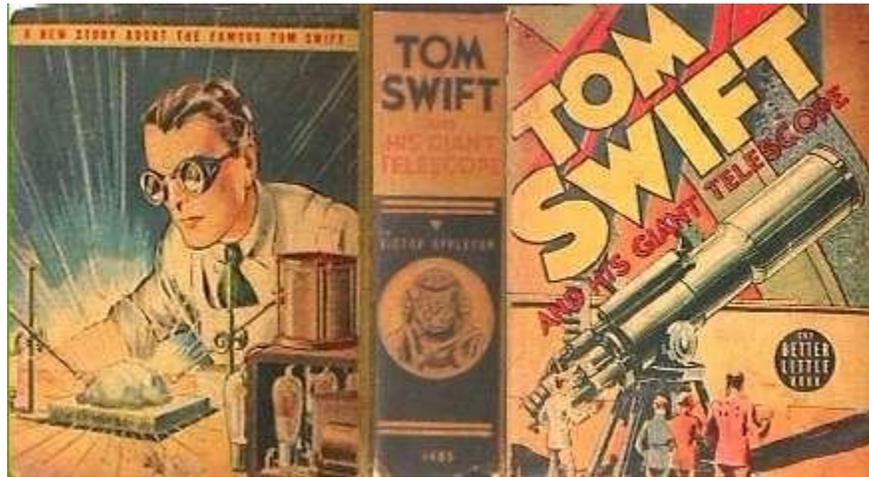
Geography: Ambolata remains in an unspecified location of South America, but some additional details are revealed about its topography. Pabalo is the capital village. The Parana (piranha?) river runs through it, and it is said to have a "temperate climate" in spite of being located in a sub-equatorial / tropical region. That would lend it to being in a location at some altitude, although "jungle" vegetation is typical in the

story, and mountains are not mentioned. The country is 3-days' flying time from Shopton, via *Sky-Train* traveling at a moderate speed. This would put it in the northern half of South America, by my calculations.

JP Karenko, May 11, 2006

#39. Tom Swift and his Giant Telescope (1939) (Review 1)

by Victor Appleton



Summary: "It's magic!" Ned exclaimed, and in a way it was: the great inventor Tom Swift had developed a fantastic new type of lens that played tricks with light. Pass an electric current through the lens and it would vanish before your eyes: look through the 'vanished' lens and it would magnify objects with a power far in excess of any telescope.

The material that Tom used to make the lens was extracted from the planet stone which Tom found on a recent expedition to Koku's native land. Tom speculated that the meteorite he had found was launched to Earth by intelligent beings from Mars -- and Tom hoped that his Giant Telescope would enable him to settle the question of Martian life once and for all.

His quest to build the telescope was soon hampered by dangerous villains who were after Tom's secret formula for a completely flexible and yet unbreakable glass. At first the villains merely questioned Tom's lifelong friend Mr. Damon for information, but when Mr. Damon proved uncooperative they tried to kill him in a staged automobile accident -- and when their effort landed him in the hospital they started making attempts on Tom himself.

Meanwhile Tom's telescope project was hit by a staggering blow: the only source of material for his lens was locked up in the planet stone he had found, and the planet stone was lost overboard while being shipped via freighter to the US.

Tom launches a desperate attempt to salvage the stone before shifting ocean currents hide the stone forever. The stone, though, lies three hundred feet beneath the ocean's surface -- and Tom's two salvage divers are forced into a vicious struggle for life when a deep-sea creature attacks them.

Tom must descend in person to rescue the divers and the stone from the clutches of the sea. How Tom retrieves the stone, builds the telescope and makes his astonishing discovery are told in *Tom Swift and his Giant Telescope*.

First, a Word on the Book Itself

Tom Swift and his Giant Telescope is the 39th book in the Tom Swift series, and as such it follows the Planet Stone in both publishing order and storyline. However, a number of drastic changes were made between the Planet Stone and the Giant Telescope.

First the Giant Telescope was written and published by Whitman -- the same company that published reprints of the last ten Tom Swift books. The Giant Telescope, though, looks nothing like Whitman reprints, because it isn't a 'normal' book at all: it's a Better Little Book.

The Better Little Books (called BLBs) are basically super-condensed stories that have an illustration on every page. The entire book reads like an old black and white movie: a page of words and a page of picture, followed by a page of words and another page of picture, and so on for 425 pages. All the familiar characters are still there, but the writing quality has seriously gone downhill; it doesn't read anything like, say, *Tom Swift Among the Diamond Makers*.

I don't know why Whitman chose to release a Tom Swift book in the mass-market Better Little Book format. Perhaps the Tom Swift market was dying, and they thought that he might have a chance as a Better Little Book character. At any rate, he did seem to have some sort of success: Whitman did release *Tom Swift and His Magnetic Silencer*, another BLB, sometime later.

Both of the Tom Swift Better Little Books are extremely rare. Most likely, this is due to a limited print run and the wear and tear of half a century: the books aren't nearly as sturdy as their Grosset & Dunlap cousins, and the quality of the paper is quite poor. Of the two BLBs, the Magnetic Silencer is the rarer of the two -- which is fitting, perhaps, as it is the last book in the series.

Major Inventions

The major invention in this book is, of course, Tom's **Giant Telescope**. The development of his telescope was made possible by the meteorite Tom found on his expedition to South America in the previous volume (*Tom Swift and His Planet Stone*). It seems that the stone has an amazing mineral in it: in the raw, the mineral was a somewhat unattractive opaque green -- but run an electric current through it and the mineral became invisible.

What interested Tom even more was that the mineral had fantastic optical qualities: it had a resolving power far in excess of any telescope in existence. Even today's telescopes would pale in comparison: Tom's

telescope could have read license plates on Mars -- had there been any license plates on Mars for him to read. That's not bad for a 10-meter lens!

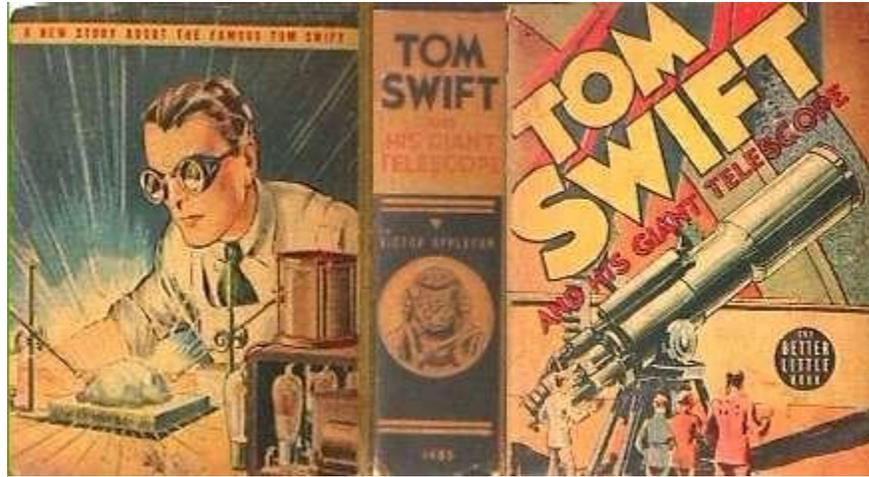
Tom built his telescope in the Adirondack Mountains in order to avoid the smog and pollution that was a problem at lower altitudes. This practice is still common today: the search for a pollution-free sky is why so many telescopes are built in Hawaii and out in the desert.

Strangely, most of Tom's troubles with villains did not stem from this extraterrestrial mineral: it came from Tom's attempts to make a flexible, unbreakable glass. Somehow a nearby glass company got word that Tom had developed a new kind of glass, and two ex-employees decided (of course) to try to steal the formula. As usual, Tom's security fence was ineffective; even his Chest of Secrets was unable to keep the dastardly villain out. This lack of security seems to be a genetic defect in the Swift clan: Tom Swift Jr. had equal difficulty keeping intruders out of Swift Enterprise and secrets out of his enemy's hands.

I thought that the idea of making a flexible, unbreakable glass sounded familiar, and I found out I was right: Tom Swift Jr. later invented something very similar in the book *Tom Swift and His Subocean Geotron* for a deep-sea aquarium. It's odd that Tom's own son would one day reinvent something that Tom had perfected long ago. Perhaps Tom's glass wasn't strong enough for Junior's purposes...

#39. Tom Swift and His Giant Telescope (1939) (Review 2)

Review by JP Karenko, May 2006



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

Tom Swift has discovered that the wondrous "Element X" that was found in the Planet Stone meteorite, can be used to produce a green glass with remarkable optical properties. The only supply of the element lies on the bottom of the Caribbean Ocean after it is jettisoned from a cargo ship during a storm.

Tom must recover the element in order to make an observation of the planet Mars, the suspected source of Element X. Industrial spies, robbers and saboteurs stand in his way, however and he must battle not just the hazards of the deep sea, but inimical enemies who try to rob and kill him.

How these problems are resolved, you will have to locate a copy of the story to find out.

Cast of Characters (More or less in order of appearance)

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. In this tale we find he is fit, tanned and does not smoke cigars.

Ned Newton--Chum & companion of Tom. No description given. He continues his position as Swifts' financial advisor and CFO (Treasurer) of Swift Construction Company. He is the voice of caution regarding Tom's expenditures, sometimes obnoxiously so.

Koku--Giant 9ft tall manservant of Tom. Devoted, loyal, and possessed of great strength, but apparently somewhat limited cognitive facilities. Described as "savage and only half-tame," he is antagonist and rival of Eradicate. In this episode, he is once again a mere watchman/guard and is denigrated with the term "boy," several times.

The Insidious Intruder--Sneak thief / burglar who appears several times in the story.

King Amo--Youngest of Koku's brothers. Monarch reigning in Ambolata, or Giant Land, South America. Sends Tom an important message.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be blessing everybody and everything near his person. Never fully described, except as "portly" with a moustache and "tortoise-shell glasses." Appears to be quite wealthy. In this tome, he is "spry" jolly looking" and carries a cane. Has once again taken up his old hobby of wrecking transportation conveyances.

Hiram Leatherby--Annoying neighbor of Wakefield Damon. Retired Director of Shopton National Bank, he bothers Mr. D with discussions of his fossil collection. While the Shopton bank has had several directors, this is the first mention of this one, even though he was allegedly Ned Newton's boss before Ned moved up in the financial world.

Duo of Dastardly Damon Delinquents--Pair of nogoodniks posing as lost cousins of Wakefield Damon. They assume false names of Brown and Jones and claim to be Damon's relatives. Later determined to be Messrs **Hammer** and **Anton**, sneak thieves looking to steal Tom's flexible glass formula. Currently in custody.

Mr. NFN Stern--No description. President of Apex Glass Works, a rival concern located 50 miles north of Shopton in Portville, NY.

Happy Harry & Dr. Bane--Nemeses from previous adventures, mentioned casually in conversation. No significant parts in story.

Barton Swift--Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. In this episode, he is rejuvenated. Mr. Swift is now working on a book about electricity, and plays chess incessantly.

Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro manservant. "Eradicated dirt" in his younger years. Rad has now "become too old to do much," As described, he now has "white hair in a fringe and is bald on top and shuffles." He remains faithful to Tom and his father and helps out where he can. Constant rival and antagonist of giant Koku.

Mrs. NFN Damon--Never described, she tries to keep her husband on a short leash. Her plan is to keep him home instead of traveling with Tom. Not very successful, as she spends much time at her mothers' home, most likely providing elder care.

Dr. Chester Chilton--Introduced in the previous volume as a newcomer to Shopton, he is "exceptionally well educated and a very likeable person." Attending Mr. D's injuries.

Shopton Police Chief--No name or description. Walk on part.

A. Mawson--Captain of S.S. Perry freighter who must jettison Tom's meteorite in order to save his ship in a tropical storm.

John Britten--Captain of salvage barge Betsy B. Red faced and grizzled, an old friend of Barton Swift and a salty dog if there ever was one. Sincere, friendly and slightly eccentric (aren't all Tom's friends?) he talks like a movie pirate (the seafaring kind, not the baseball team.)

Trio of Dusky Deckhands--No names or descriptions other than "grinning darkies." These "retainers of Captain Britten" may be the same men who act as divers, later. If so their names are **Manuel** and **Alvarez**. The third man, an "engineer," is not named.

Ruiz--NFN or description. Cook on the Betsy B. Described as "coal black" and speaking Spanish.

Prof. NFN Standish--educator at a state college, who lends Tom a "large refracting telescope" for his research.

The following major characters are absent from this tale or only have passing mention:

Mrs. Baggert--Swift's aged housekeeper and mother figure. In this tale, she has passing mention only.

Mrs. Mary Nestor Swift--Love interest and radiant bride of Tom. Described as a "very pretty young woman with flashing brown eyes, and a sweet trilling laugh." Blushes easily, especially around Tom. Also described as "plucky." No mention.

Garrett Jackson--No description given, but is spry and fit for his age. (Original volumes described him as "aged.") Swift Construction Shop Manager/General Foreman. No mention.

Helen Morton--Fiancee and love interest of Ned Newton. No mention.

Major Inventions:

Bendable Glass--A special formula and annealing process creates a glass that is clear, but flexible enough to tie in a knot. It will not shatter when smashed with a hammer. No details of the material except a slow and complex annealing process.

Transparent Glass--Made from ground, refined and cast molten "Element X," this green opaque and unremarkable material literally vanishes when an electric current is passed through it. It has wonderful optical properties that allow it to be used as a booster for ordinary optical devices. This allows them to produce magnifications far above those available with ordinary optics. TG is made from "Element X" which is only found in meteorites. The material is ground, dissolved in acid and refined into a yellow

powder. The powder is melted, cast into a lens and then slowly and torturously annealed and cooled, producing the opaque green glass. When electrical current is passed through the material, the optical properties change and it becomes clearer than the finest well...glass. The ability to be flexible allows fine tuning of the optic path, creating great improvements in magnification.

Commentary on Society, Attitudes, Environment & Errata

Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted. It also has given me a grasp of just how technologically and culturally unsophisticated the average reader was in even the 1930's.

Attitudes and Prejudices: This tale is attributed to a (new) ghost writer, one Thomas Moyston Mitchell. A Google search turned up no references for a Thomas Moyston Mitchell, but a Thomas (NMI) Mitchell (b.1892-d.1962) was listed as an actor/screenwriter/playwright. Whoever it was penned this tale, had an intimate knowledge of many previous stories (references to past events were accurate and frequent) and the "look and feel" of the characters and environment were familiar. For example, SCC and Tom's "private laboratory" were in Swift's "back yard," again, and not the sprawling distant walled manufacturing complex described recently. Much ado was made of the vault under Tom's lab, but several references to it as his Chest of Secrets were incorrect. Language usage, while modern, included references to "jigger," "by Jove" and "old man," phrases not used in some time. This author had the same writing style as #34 and #37.

Eradicate (Rad) is portrayed even more stereotypically than usual. His language is much more a deep-South patois than in previous volumes. Bart Swift (Tom's father) has once again been rejuvenated, and is up and around, playing spirited games of chess with all comers and writing books. Mary Nestor Swift, Tom's wife, is conspicuously absent. Ned's fiancée, Helen Morton, is also MIA. Mr. Damon gets in a car wreck, too, his first crash since Episode #35 TS and His Giant Magnet.

Captain Britten sounds like a Hollywood pirate, with much "avast-ing" and "lubber-ing" going on. Koku once again, sounds more like a cigar-store Indian, than an exiled South American Indio, who has spent the last many years in Shopton, getting "civilized."

The Flying Boat, Winged Arrow, is resurrected and details of operation are accurate, but the fabulous deep-sea diving gear invented in Episode #4 TS & His Submarine Boat, are forgotten, and "modern" diving equipment, only good to 1/3 of the depth of Tom's inventions (200ft), must be used. This adds to the peril of all involved, since Tom's pet rock lies in 300ft of water.

Errata: There is a running gag throughout this series. Mr. Damon's home keeps flip-flopping between Waterfield and Waterford, NY. Sometimes it is in neither, and several times in both places, at once. This is

partly due to the enforced poor communication amongst the many ghostwriters at G&D that contributed to this series.

There are now 4 distinct categories. In this tome, Mr. D's home is in **Waterford**.

The tally for 39 volumes, to date is:

Waterfield-17, Both places-2, Waterford-11, and Neither Place-8.

Errors in spelling and malapropisms were rampant. Dozens of them were sprinkled through the story, too many to list. However, since this was an e-text, I cannot say if they were introduced in transcription, or were the result of quick-and-dirty editing for a cheap BLB edition.

Engineering and Science, Fact vs. Fantasy:

Reality mimics fantasy 60 years later... Keck Observatory has a **multifaceted** (i.e. "flexible") telescope that is of variable geometry. It can adjust for atmospheric distortion in real time and is the future of astronomy both on earth and in space. **Largest Reflecting (mirror) Optical/Infrared Telescope:** Keck-9.8 m (32 ft), on Mauna Kea in Hawaii (segmented mirror; 2 equal-size telescopes) 9/2005

We are not up to the kind of magnification that allows us to see Martian cities, but they may just be well camouflaged.



Mars Rover Live Photo

I still say firing a plasma electric gun submerged in seawater will do as much damage to the firer as it does to the firee, but Tom dispatches the obligatory "sea monster" with his Electric Rifle, late in the tale.

Geography: Portville, NY is located "50 miles" north of Shopton and the Adirondack Mountains of NY are conveniently close by to provide a location for Tom's observatory.

Port Baracoa, Cuba exists and is a beautiful location on the East end of the island. However, it's more like 500 miles from the closest point in Key West. Also the water is deep enough to make salvage operations (in 1939) hazardous.



Porto Baracoa, Cuba

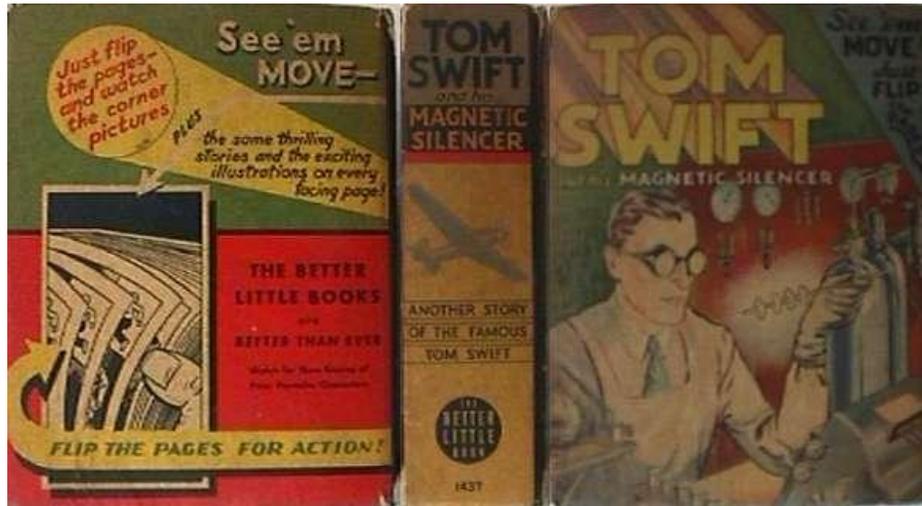


Sunken Treasure

JP Karenko 5/11/06

#40. Tom Swift and his Magnetic Silencer (1941) (Review 1)

by Victor Appleton



Summary: "Bless my potato patch!" exclaimed Mr. Damon. "Tom Swift, I never head of such a thing!" And no wonder! This time Tom seemed to be insane: his latest invention was a bomb that could be used to plant seeds. The bomb proved successful, but also dangerous: when Tom tried it at Mr. Damon's farm, the bomb went off prematurely and almost killed him.

Meanwhile, the government of Ruthenia tried to get Tom to build them the ultimate weapon: a completely silent airplane. Armed with this airplane, Ruthenia hoped to vanquish its enemies. Tom turned him down because the Army had already hired Tom to build the same thing -- but that didn't please Ruthenia any. It seems that another inventor almost has the secret...

Tom, though, has an edge. On a recent trip out West Tom found a peculiar ore that can literally absorb sound waves. Armed with this invention, Tom hopes to build the soundless airplane -- *if* he can find a way to extract the ore.

The ore proves highly dangerous: an early attempt at extracting it seriously poisoned the young inventor. Only the brilliance of Barton Swift, combined with the hearty music of an obnoxious band, saved Tom from an early grave. How Tom manages to perfect his ore and build a soundless airplane while dodging the vicious assaults of the Ruthenian Purple Shirts is told in the fascinating tale of Tom Swift and his Magnetic Silencer.

Major Inventions

There are two major inventions in this book. The most prominent and important one is **Bartantalum**. Named after Tom's father Barton Swift, the metal is perhaps the most unusual ore Tom ever came across. Throughout the course of the Tom Swift and Tom Swift Jr. series Tom discovered a number of fascinating metals: there was the ore in the Giant Telescope that became invisible when energized; there was Inertite from the Caves of Nuclear Fire that could protect anything from cosmic rays; there was the super-strong Durastress from Tom's Triphibian Atomicar; the unbreakable glass from the Subocean Geotron; and so on.

Bartantalum, however, is the most incredible and unbelievable of all. I can believe unbreakable glass and Durastress. I might even be able to believe in the invisible ore and the radiation-neutralizing paint. But who ever heard of a metal that could absorb sound like a sponge? The Silentenna from the Sonic Boom Trap I can believe: there Tom invented a machine that created waves out of phase with the surrounding sound waves in an attempt to help deaden sound. That sort of thing occurs every day on airplanes: without such sound-neutralizing equipment a flight across the Pacific would be a harrowing flight indeed.

But absorb sound like a sponge? Sound isn't some kind of chemical; it's a wave -- a disturbance, really. Sound can be canceled out, but not absorbed. Compare this to light: if light strikes an object, it's possible to paint the object black and thus 'absorb' the light rays that hit it. What isn't possible is to build an object that sucks all the light rays out of the room and makes the room pitch black -- and that is precisely what Tom's Bartantalum did.

Tom went through several steps to process his Bartantalum. First, he crushed the raw ore:

As soon as Tom got back to the laboratory he told the giant to open the crate. Inside were several strong canvas sacks which held the ore, a mass of lumpy gray rocks speckled with streaks of glittering color. This was dumped into the hopper of a powerful crushing machine.

"Thanks, Koku. I won't need you any longer," said Tom, starting the mechanism which at once began chewing the ore into a fine powder

Once the ore was crushed, he put it in his "wonderful electric furnace" and melted it down:

As he finished speaking a whirring noise came from the crusher. Tom hurried over and turned off the motor. The powdered ore had fallen through the trap in the bottom and now was collected in a steel bin. Some of this the young inventor weighed out. Then, after putting on a pair on heavy gloves for safety he added this to the chemicals in the crucible. Next he stirred the contents together thoroughly with an iron rod, shoved the container well back into the furnace and closed the door.

"That's that," he announced, turning up the heat-control lever. "She'll cook along all night and sometime tomorrow ought to be ready."

The extracting process wasn't easy. Tom's first few attempts weren't exactly successful:

"Well, yes, that's the basic principle," admitted Tom. "But it's not so easy to put into practice. First the metallic salts contained in the ore must be broken down, then refined by fusing them with suitable chemical reagents. This is a pretty tough problem. All my attempts so far have failed. But with this fresh batch of ore and my new vacuum process I believe I'll get good results this time."

Eventually, however, Tom hit upon the secret:

"And do you know I got a couple of good ideas while we were out there! If the Bartantulum were fused with rubber and aluminum it would be much more efficient."

The Bartantulum worked splendidly; much better than Tom Jr's more realistic Silentenna ever did. When Tom first attached the bullet-shaped Bartantulum cylinder on an airplane, however, it shorted the plane out and almost killed him. Tom fixed this problem by installing a cooling system. The plane worked as ordered: in the Army tryouts, Tom's plane carried the day!

Tom Swift's second invention in this book was his (as Ned called it) **controlling bomb-planter**. This is probably one of Tom Swift's wackiest inventions ever: basically, he filled a bomb with seeds (instead of shrapnel) and set off the bomb, thus planting seeds all over a field. An adaptation of the invention could be filled with insecticide.

The first trial of the invention on Mr. Damon's new farm didn't quite go as planned: the bomb went off a bit early and almost killed Tom and Mr. Damon. Neither were injured, but as Mr. Damon said: **"I came very near smothering!" he complained. "Bless my oxygen tank, but this is scientific farming with a vengeance!"** When Ned (who saw the explosion) found them, he was a bit confused: **"Kernels of corn!" exclaimed Ned, picking up one of these. "Have you invented a way to make corn explode?"**

Tom later explained in detail how the invention worked. I imagine that there are a few technical difficulties that the author forgot about (!) but I'll quote it here:

"All right," said Ned, "and while we work tell me more about your controlled bomb-planter."

"It's quite simple," replied young Swift. "I take a conical container of very light metal and put the grain to be planted in concentric chambers around the charge of explosive in the center. These chambers are weaker the farther they are from the center. This allows the seeds in the outer ones to be shot to a greater distance than those within."

"It doesn't sound simple to me," said Ned. "But it's wonderful."

"Arranged a little differently," went on Tom, "a charge of insect killer can be substituted for seeds and one or two bombs would be able to spray a large orchard."

I think that this invention is far more practical than Bartantalum. Sound just can't be soaked up: it can be cancelled out, but that is a radically different thing. I do believe that this bomb planter suffers from some serious flaws: I just don't think it could work as described. Bombs are built for destruction, not for planting seeds: I have a feeling that an explosion big enough to scatter seeds over a 10 acre field is big enough to do bad things to the seeds it scatters. Then there is the matter of damage to the field...

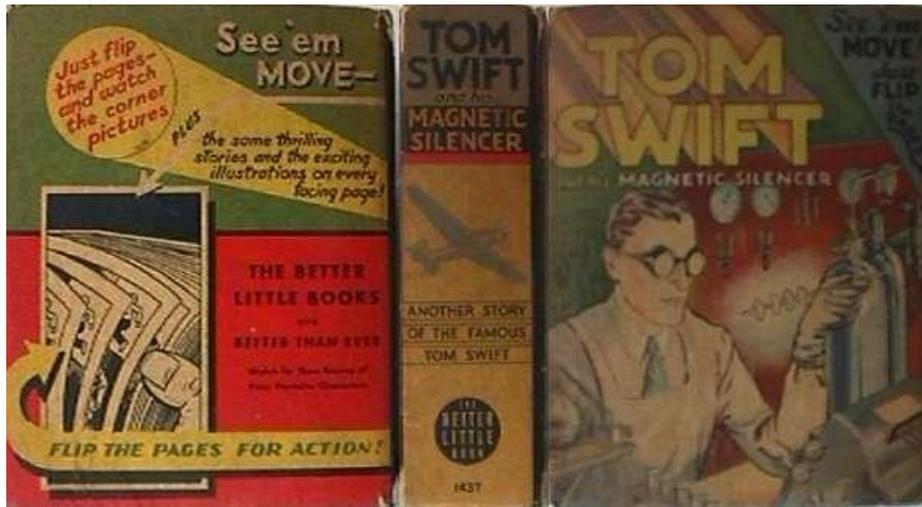
In terms of the series, this is definitely the weakest book of them all. The inventions in this book are ridiculous, the plot is painfully silly and thin, and the villains are the strangest I've ever seen. It would have been nice if the series could have had a good, solid ending like the Rick Brant series did, but that didn't happen.

In a way, though, the story doesn't end here; Tom Swift is still alive and well when the first Tom Swift Jr. book *Tom Swift and His Flying Lab* opens, and he is still inventing and acting when the series ends at *Tom Swift and the Galaxy Ghosts*. Eradicate, Koku, and Mr. Damon are gone but not forgotten: throughout the series they are mentioned from time to time as inventions are fondly named after them. Tom Swift's company grew over the years to fantastic proportions as he battled the evil Brungarians and expanded into outer space. Tom's inventions are referred to and occasionally used, and his son remodeled a few of the better ones (such as the Television Detector) to bring them up to modern times.

Counting the 40 volumes of the original series plus the 33 of the Tom Swift Jr. series, Tom Swift appears in 73 books -- not bad for an inventor! If he was born in 1893 (which is my best guess) he would be more than 100 years old now, with his son Tom Swift Jr. (born around 1936) in his 60's. Their inventing days might be over, but he and his son have not been forgotten -- and here's to hoping they never will be.

#40. Tom Swift and His Magnetic Silencer (1941) (Review 2)

Review by JP Karenko, May 2006



Summary: No official summary was ever provided with any of the old Tom Swift books. However, without giving too much away, the plot can be summed up as follows:

Tom Swift has discovered yet another wondrous element, Bartantalum. An ore that was discovered during an un-chronicled western vacation trip, can be used to produce a blue powder with remarkable acoustical properties. It absorbs sound like a sponge. The only problem is that when the material is subjected to high temperatures, it causes electrical disruption similar to the effect of Electro Magnetic Pulse (EMP). It is also a potentially lethal contact poison. Tom carelessly gets it on his bare skin and is nearly killed.

Tom must discover the means of producing the material without destroying *Swift Construction Company's* power house. The EMP emission destroys even the most robust electrical equipment and wiring. He must also battle the usual inimical enemies who try to rob and kill him to obtain the secret of the material.

How these problems are resolved, you will have to locate a copy of the story to find out.

Cast of Characters (More or less in order of appearance)

Ned Newton--Chum & companion of Tom. No description is ever given. He continues his position as Swifts' Business Manager and CFO (Treasurer) of *Swift Construction Company*.(SCC) He is the voice of caution regarding Tom's expenditures, sometimes obnoxiously so.

M. Pedro Gonzo--Nervous and impatient, he is a representative of a wealthy family in the fictional (European?) country of Ruthenia. He speaks with a heavy accent that sounds much like French.

Mr. Wakefield Damon--Elderly & eccentric adventurer whose main purpose in life seems to be *blessing* everybody and everything near his person. During the series, his appearance changes several times. He goes from being "too fat to walk much" and suffering from chronic liver ailments, to being merely "portly" and then to "spry" and fit enough to hike & climb in the Rocky Mountains. He wears a "luxuriant" snow-white toupee & tortoise-shell glasses and has a moustache. He is described as "jolly looking" and carries a newfangled steel cane He appears to be quite wealthy from business dealings and investments. In this tome, he is once again stout and is absent minded. He has also dropped enough years to be considered "middle aged," rather than "elderly." He has also purchased a farm (to what end is not really explained) but probably to give him a safe place to retreat to when his somewhat overbearing wife tugs his leash too vigorously.

Tom Swift--Intrepid inventor & mechanic. Plucky, lively, resourceful, brave and clever. Home-schooled at a college level by his father, Barton Swift. Athlete and hunter. Familiar with how to stalk game and firearms. Loves all things mechanical. He stands 6ft tall, is fit, tanned and a non-smoker. Probably handsome, too, but that is never mentioned. The archetypical All-American Hero. In this episode, he celebrates an unspecified birthday. Since superheroes never age, he is still a young man. In a real world, by now he would be pushing 50.

Pharmhand Phred--No real name or description given. He has a bit part, providing directions to Ned Newton. Ned is searching for Mr. Damon's farm.

Rumble--NFN. A swarthy, forbidding sort of man. He has close-cropped, bristling black hair and a deep, rough voice. He is originally introduced as the caretaker of Mr. Damon's farm. He is later determined to be a generic nogoodnik, and a robber, using the farm as a hideout.

Blondie--No real name given. Companion to Rumble s(he) is "a hard-faced blonde woman" who has a bold stare. Later insinuates into the Swift household as a maid, for the purpose of burglarizing the place. Blondie is actually a male, as determined at the end of the story. Whatever disguise he used must have been a doozy, as it fooled both Ned (from a short distance) and Mrs. Baggert, up close and face-to-face.

Mrs. Damon--She is never physically described, nor is her name given. She tries to keep her husband on a short leash. Her plan is to keep him home or attending social parties instead of "gallivanting" with Tom. She is not very successful, as she spends much time at her mothers' home, (most likely providing elder care) which allows Mr. D to roam freely. She has a bit part as a voice on a phone line in this tale.

Koku--Giant manservant of Tom. He is devoted, fiercely loyal, and possessed of great strength, but apparently somewhat limited cognitive facilities. Described as "savage and only half-tame," his height changes several times in the series, varying from over 9ft to almost 7ft-to merely a "veritable" giant-ness. He is antagonist and rival of Eradicate, the Swifts' negro servant/handyman. In this episode, the author splits the difference and he is 8ft tall. Once again he is a mere watchman, guard and heavy lifter. His speech patterns remain very much like those of a Hollywood B-western Indian, in spite of close association with English speaking Americans for many years. In this

episode, Tom summons him by whistling. Such behavior demonstrates the continuing denigration of persons of color in the series.

Barton Swift--Widower. Wealthy and conservative. Inventor, master machinist and holder of numerous patents. In this episode, he is rejuvenated. Mr. Swift is now working on several books and stays on top of Tom's research projects. He is described as "a dynamic personality," and "takes charge" of any situation he finds himself in.

Express-man Ed and Helper Henry--Faceless and nameless characters that show up to make a delivery of the raw materials for Bartantalum. Bit parts in the story.

Eradicate Andrew Jackson Abraham Lincoln Sampson, A.K.A. Rad--Aged stereotypical Negro manservant. Used to "eradicate dirt" in his younger years. Rad has now "become too old to do much," As described in previous volumes, he now has "white hair in a fringe, is bald on top and shuffles." He remains faithful to Tom and his father and helps out where he can. Constant rival and antagonist of giant Koku. In this tale he is described only as "old," and seems to be enjoying improved health. Previously he was near death's door due to advanced old age. He is called a "darker" by Tom, and shares the same "status" or lack thereof as Koku does in the author's eyes.

The Purple Shirts--Ruthenian revolutionaries (obviously patterned after the "brown shirt" Fascists in Italy.) Want Tom to build them noiseless aircraft so that they can depose the current government of Ruthenia.

Garrett Jackson--No description given, but is spry and fit for his age. (Original volumes only described him as "aged.") Previously, *Swift Construction's* Shop Manager/General Foreman, he is now "Chief Engineer" in the powerhouse/electrical generating plant, and "has been employed by the Swifts for many years."

Blackjack Bob--Rough and deep voiced hooligan (probably Rumble, although this is never stated) who mugs Tom and steals important papers contained in a wallet.

Trooper Terry--No name or description given. (NY) State policeman who pulls Tom over for suspected drunk driving. Tom is woozy from the beating he took during the mugging. When the motorcycle cop realizes what happened, he stashes his bike and gives Tom a ride home.

Dr. Granville--NFN or description. *SCC* Company Doctor, he treats Tom unsuccessfully for exposure to the Bartantalum powder.

Mr. Mawson--NFN or description. *SCC* Chief Chemist. Called in to consult in the case of Tom's poisoning.

Mrs. Baggert--Swift's aged housekeeper and mother figure. In this tale, she has a minor part and apparently cannot see well enough to detect a man dressed as a woman. She hires the cross-dresser as a temporary maid. Bustles about and claims that she needs no help around the Swift manse. Previous episodes had her bossing several scullery maids.

Detective Bright--NFN. He was a keen, shrewd-looking young man, who speaks in short jerky, staccato phrases. Employed by a local private investigation firm on retainer to *SCC*.

Phireman Phrank--No real name or description given. *SCC* smoke eater who responds to a fire in Tom's lab. Pulls Tom to safety, when he is overcome by fumes.

Chief Char-ley--No real name or description given. *SCC* fire department manager. Pontificates on the source of the blaze in Tom's lab.

Mailman Mike--No real name or description given. Arrives with a special delivery envelope for Tom.

Mr. Smathers--No real name or description given. Rival inventor, competing for the contract to build silent airplanes for the Army.

Lt. James, US Army--No first name or description given. In charge of prototype testing for the silencing devices. Bit part, introduced and discarded.

Col. Brooks, US Army--No first name or description given. Project manager and superior of Lt. James, he has "final say" about which silencer is purchased. Bit part, introduced and discarded.

The following major characters are absent from this tale or only have passing mention:

Dr. Chester Chilton--Introduced and having pivotal roles in the two previous volumes as a newcomer to Shopton, he is "exceptionally well educated and a very likeable person." Conspicuously absent from this tale.

Mrs. Mary Nestor Swift--Love interest and radiant bride of Tom. Described as a "very pretty young woman with flashing brown eyes, and a sweet trilling laugh." Blushes easily, especially around Tom. Also described as "plucky." No mention.

Helen Morton--Fiancée and love interest of Ned Newton. No mention.

As is usual lately, many of these characters (especially the ones introduced late in the story) do not rate any development or even a description. They are brought forth and discarded after they do their bits to make the story flow. The (hopefully humorous) alliterative names are my "inventions" to make reading these reviews a bit more fun.

Major Inventions

The Controlled Bomb: A cone-shaped device with an explosive charge in the center, used to disperse various "products" around an open area. The products, such as seed or insecticide powder are placed in layered baffles that allow even dispersion when the explosive charge is detonated. It is also suggested that shrapnel could be the payload during wartime, and thus the precursor to the "Claymore Mine" can be credited to our decidedly pacifist-minded hero.

Bartantalum: Made from ground, refined and cast molten unspecified ore, this blue powdery and remarkable material literally absorbs sound like a sponge. It has wonderful acoustical properties that allow it to be used as a "magnet" to reduce sound emissions from sources merely *nearby* and not in contact with the material. The unspecified, but heavy ore is ground, dissolved in acid and refined in an electric furnace under vacuum. When a certain critical temperature is reached (as signified by a green flame) the material disrupts electrical machinery, causing circuit breakers to melt, wall wiring to start fires and motor ignition systems to cease functioning. Tom may have discovered EMP, as there is concern expressed for a radiation hazard. The material is also a highly toxic contact poison, as Our Hero learns when he gets it on his skin and is only saved in the nick of time by his father, Barton.

Electric Vacuum Smelter: An electric powered "clean" furnace under development for a large steel manufacturing company. Tom uses it for refining the Bartantalum alloy.

Commentary on Society, Attitudes, Environment & Errata

Reading the old Tom Swift Sr. series has really given me an appreciation of all the modern gadgets that I've come to take for granted. It also has given me a grasp of just how technologically and culturally unsophisticated the average reader was in even the 1940's.

Attitudes, Prejudices and Author's Identity: This tale is attributed elsewhere to a ghost writer, one Thomas Moyston Mitchell. A Google search turned up no references for a Thomas *Moyston* Mitchell, but a Thomas (NMI) Mitchell (b.1892-d.1962) was listed as an actor/screenwriter/playwright.

Whoever it was penned this tale, was *not* the same person as the author of the previous two adventures. S(he) had at least a passing knowledge of the many characters in other stories, but the "look and feel" of the characters and environment were only passing familiar to the last few volumes.

On closer examination, many details do not match up. For example, *SCC* and Tom's "private laboratory" (which is now air-conditioned and has an adjacent apartment) were no longer in Swift's "back yard." *SCC*'s sprawling, distant and walled manufacturing complex, described in previous tomes, again requires an automobile ride to get to from the Swift manse. *SCC* is once again big enough to rate chemistry and legal departments and now has its own coal-fired power generating station. In the previous two tales, much ado was made of the vault (erroneously called the *Chest of Secrets*) under Tom's lab. In this tale, all of Tom's valuables are left exposed where they are at risk to the hazards of theft and destruction by fire or the ravages of an automatic sprinkler system.

Another characteristic (previously exhibited) of this writer was the abandon with which characters were introduced, used and discarded. They come and go like cartridges through a sub-machine gun. This author had a writing style/attitude very similar to Volume #37 and to a lesser extent, #36. These include a pacifist & ultra-temperate outlook, ambiguous geography and a total absence of female love interest for both main characters-Mary Nestor Swift, Tom's *wife*, is conspicuously absent, as is Ned's fiancée, Helen Morton. Koku, once again changes size and is now only 8ft tall. Eradicate (Rad) is portrayed in his usual stereotypical manner, with the usual denigrating reference to his color. Barton Swift (previously invalidated by old age and a heart condition) remains rejuvenated, and is up and around, writing books and staying on top of his son's projects. Mr. Damon does *not* get in a car wreck, as has been *de rigueur* in past adventures. Mrs. Baggert the Swift housekeeper, and Garret Jackson, the *SCC* "Chief Engineer," also reappear for the first time in a long while, in this tale.

Shopton, which has varied from a "small village" to a "small city with suburbs," is back to being a "small town," but it rates a private detective firm that is on annual retainer to *SCC*. Local police and G-men,

previously mostly incompetent and bumbling, are back to being effective minions of law-enforcement, a la Volume #36. The FBI is quite well-regarded, probably after a pointed phone call to the author from J. Edgar. (JEH did things like that...)

Notably, and for the first time in nearly forever, Tom does not "rescue" someone from danger. It has previously been "in the formula" that one or more characters are beholden to Our Hero for the preservation of life and limb. He does, however, suffer the usual panoply of personal violence, including mugging/robbery, poison/drugging, smoke inhalation, and for the first time, having to parachute from a burning plane. However, no chloroform (the authors' drug of choice) was released in this tale.

War (WW2) and warlike times are finally referenced in several places in the story. This is only the third time that real-world events actually play a part in a TS story. The others were Volumes #21-22 *War Tank* and *Air Scout*, referencing WW1. Tom remains Militantly Pacifist, emphatically saying, "They'll never kill men with *my* ideas!"...except, maybe with *Giant Cannons*, *Aerial Warships*, *War Tanks*, *Air Scouts*, and (military) *Floating Airports*...There's also that wonderfully lethal *Electric Rifle* right at the top of the list. Go figure. See also, below, regarding "controlled bombs."

I feel that whoever it was wrote the original draft manuscript for this tale, had previously penned one or more of the TS stories. I suspect the "author" merely dusted off an unused early draft and "filed off the serial numbers." At 32 pages (the usual story was padded out to 200+ pages) this tale is a "short story" at best. Frankly, the way it is thrown together, it feels like quick cobble so that the series could end with a round 40 volumes. I know that if I had spent a hard earned 50 cents on this tale as a child, I'd probably think twice about investing in Volume #41, if one were ever published. I sure won't pay the premium prices demanded on *e-bay* to complete my hardcover collection.

Errata: There is a running gag throughout this series. Mr. Damon's home keeps flip-flopping between *Waterfield* and *Waterford*, NY. Sometimes it is in neither, and several times in both places, at once. This is partly due to the enforced poor communication amongst the many ghostwriters working for the Stratemeyer Syndicate that contributed to this series. In this series, some cross-pollination amongst the writers would have been a good thing, at least as far as keeping background and geographical details straight.

There are now 4 distinct categories. In this tome, Mr. D's home is in *not mentioned*.

The final tally for the 40 volumes in the series is:

***Waterfield*-17, *Both places*-2, *Waterford*-11, and *Neither place*-10.**

The numbers don't total properly, (42) because of the 2 volumes where more than one location is referenced.

Errors in spelling and malapropisms were surprisingly infrequent. Since this was an e-text, I cannot say if what was there were introduced in transcription, or were the result of quick-and-dirty editing for a cheap BLB edition.

Engineering and Science, Fact vs. Fantasy

Bartantalum: A magical powdery blue material that "attracts" sound from a distance "like iron filings to a magnet" and absorbs it like a sponge. Sigh! I can sum up with one word. Fantasy. If it were real, though, can you imagine straight through "mufflers" with no back pressure for automobiles? Then there's the nefarious aspects: Hang a bit near a gun muzzle to making a "silent" gun. (BATFE would have an absolute canary.) Personally, I'd have made a pendant necklace out of the stuff and given it to my now ex-wife. 'Nuff said? Let's move on...

The Controlled Bomb: I'd use the term "directed" rather than "controlled," here. Since Tom nearly gets blown up during a test, I'd say the "control" aspect was minimal. The idea of dispersing chemicals or seeds by an explosive is certainly possible assuming the pyrotechnics used didn't incinerate the "product" being delivered. Sixty years later, the real world mimics fantasy, but nothing as innocuous as corn seed is the payload. Tom's invention is corrupted by modern man into various implements of mayhem. Air burst munitions are routinely used to disperse everything from leaflets to mines. An RDD, (Radiological Dispersal Device.) what is popularly called a "dirty bomb," is a device (specifically used as a terror weapon) to spread contaminants of various types (biological or radiological) around. A unidirectional variant (as suggested by Ned Newton) is today's Claymore Mine.



Claymore Mine

Tom would roll in his grave, if he had one.

Electric Vacuum Smelter: An electric powered "clean" furnace under development by SCC for an undisclosed large steel manufacturing company. Tom's prototype can handle a small crucible, and will contain a 'melt' under a vacuum to prevent atmospheric contamination of the Bartantalum. Tom's

technology improvement for the furnace is not explained or described. Vacuum smelting, usually used for refining precious or reactive metals such as Gold, Silver, Mercury and Zinc had been around for some time when this tale was penned.

Geography: Shopton still sits on the shore of *Lake Carlota*, but has changed size, yet again. It is now back to being a "small town." The state it is in is not mentioned, but it sits on a major rail line and is an easy ride from NYC and Washington DC. Mansburg is still the nearest town of any size, but that is all the geography specified. Geography is mostly consistent with other stories and purposely vague.

The Whitman Tom Swift Sr. Reprints

If you've been a Tom Swift collector for any length of time you will probably have come across some rather boring-looking Tom Swift books printed by the Whitman Publishing Company. You may even have noticed that the titles put out by Whitman are identical to titles put out by Grosset & Dunlap. Where does Whitman fit into the picture?

Well, in 1938 after Grosset & Dunlap had authored their last Tom Swift book, the Whitman Publishing Company purchased the rights to reprint the entire Tom Swift series. The Whitman Publishing Company didn't reprint the entire series, however; they confined themselves to reprinting *Airline Express*, *Circling the Globe*, *Talking Pictures*, *House on Wheels*, *Big Dirigible*, *Sky Train*, *Giant Magnet*, *Television Detector*, *Ocean Airport*, and *Planet Stone* (that is, the last 10 Tom Swift Sr. titles). The Whitman reprints are not hard to find; in fact, many of the Whitman reprints are far cheaper and easier to locate than their Grosset & Dunlap counterparts.

The Whitman reprints are not as nice as their original Grosset & Dunlap counterparts. Some of the differences are:

- The original G&D books had beautiful, detailed full-color dustjackets; the dustjackets of the Whitman reprints are much simpler and shoddier.
- The original G&D books were printed on fairly high quality paper; the Whitman reprints were printed on cheap acid paper that is very prone to deterioration.
- The original G&D books had a drawing in the book to the left of the title page; the Whitman reprint does not have the drawing.
- The original G&D books had a list of titles in the front and a list of other series books in the back; both of those are missing in the Whitman reprints.

Chris Landa has also alerted me to a difference between Whitman dustjackets. The small books (7.5 inch tall) list 10 Tom Swift titles on the back of the dustjacket. The large books (8 inch tall) list either 9 titles or the back lists other Whitman series (the list leaves out Tom Swift and His Planet Stone). I had not noticed this but he is correct. The evidence seems to show that smaller 7.5 inch-tall books were printed first, then the larger 8 inch-tall ones. The list of 9 on the back of the tall Whitman editions seems good proof that the Planet Stone is *not* available in the larger format but only exists in the small format. As of today, no large copy of Planet Stone has ever been found: it is very unlikely that it exists in the larger format.

Unlike Grosset & Dunlap, the Whitman Publishing Company reprinted the Tom Swift books in a large array of different formats and sizes. I have made a table listing the different formats I have discovered so far; as I discover more I will add them to the list. As I have found pictures of these books I've added them to the table. I want to give special thanks to Chris Landa and A. Bruder, who have worked hard and from whose vast Whitman collection most of this data has come. I'd also like to thank John Kimball, Frank Krieger, and the others who have helped... I only have a handful of Whitman volumes; they have given me all the data. Thanks a lot!

	<i>Airline</i>	<i>Circling</i>	<i>Talking</i>	<i>House on</i>	<i>Big</i>	<i>Sky</i>	<i>Giant</i>	<i>Television</i>	<i>Ocean</i>	<i>Planet</i>
Small Format	<i>Express</i>	<i>the Globe</i>	<i>Pictures</i>	<i>Wheels</i>	<i>Dirigible</i>	<i>Train</i>	<i>Magnet</i>	<i>Detector</i>	<i>Airport</i>	<i>Stone</i>
Dark Brown Textured w/Black Letters	X	X	X	X	X	X	X	X	X	X
Lime Green w/Black Letters	X	X	X	X	X	X	X	X	X	X
Orange w/Black Letters	X	X	X	X	X	X	X	X	X	X
Red w/Black Letters	X	X	X	X	X	X	X	X	X	X
Tan Cloth with Black Letters		X								
Large Format										
Orange w/Black Letters	X	X	X	X	X	X	X	X	X	
Dark tan w/Black Letters	X	X	X	X	X	X	X	X	X	
Light Gray w/Black Letters	X	X		X		X		X	X	
Red w/Black Letters	X	X	X	X	X	X	X	X	X	
Blue w/Black Letters	X	X	X	X	X	X	X	X	X	
Light Green w/Black Letters	X	X	X	X	X	X	X	X	X	
Dark Brown w/Orange Letters	X					X		X	X	
Dark Green w/Orange Letters	X					X		X	X	
Dark Blue with Orange Letters	X					X		X	X	
Dark Green with Black Letters						X				
Dust Jacket - Stories for Girls and Boys	X		?		?	X	?	X	X	
Dust Jacket - lists 9 books	X	X	X	X	X	X	X	X	X	

One note: the last two entries for the 'dust jacket' refer to the Whitman editions with dustjackets. The first item refers to the dustjacket that has an ad on the back for 'Stories for Girls and Boys!'. On the inside flap of that dustjacket 7 Tom Swift books are listed, but as Chris Landa pointed out, strangely enough only 4 of those 7 listed books can be found with that dustjacket. Perhaps the other 3 were never issued in that dustjacket? The issue is being investigated, but at the moment it remains a mystery!



The Complete Tom Swift Jr. Home Page

"These are the books about a young scientist whose amazing inventions promise to be the great achievements of the future."

Hi! Welcome to the Complete Tom Swift Jr. Home Page. Tom Swift Jr., in case you didn't know, is the name of one of the most fantastic scientific inventors of all juvenile literature. The series that he starred in appeared in 1954 and lasted for 33 books, finally ending in 1971. The series, however, didn't die there; some of the older Tom Swift books are still in print today.

The reason I created this page is mainly to discuss and ponder over the incredible machines of Tom Swift. Tom, in his day, dreamed up some incredible inventions -- inventions such as a telescope with no maximum range; a beam that can *repel* anything; a machine that can create matter from sunlight; and a device that can "photograph" what an old, worn object looked like when it was first created (just to name a few). Many of these inventions have no equivalent counterpart in the mainstream science fiction books of today.

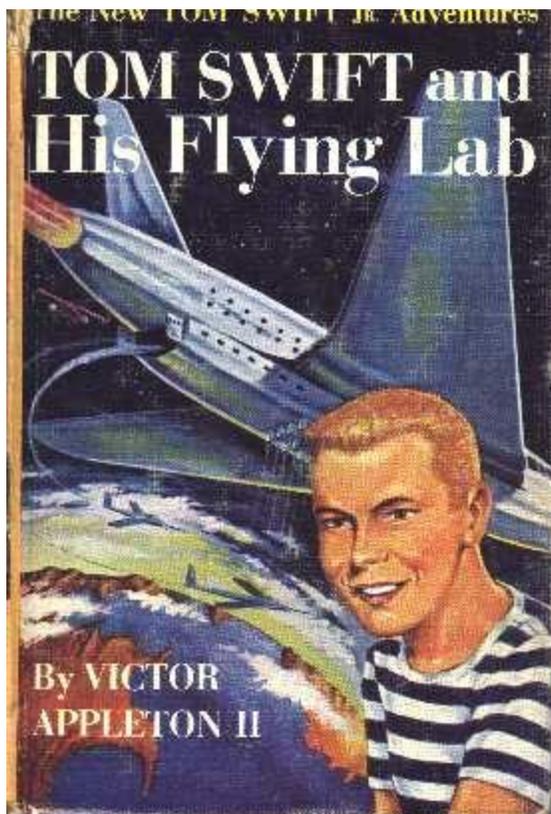
As I thought this over, I began to wonder why this was the case. Are any of Tom's inventions actually possible? What would their impact be if they were put into use today? How might life be different? As I thought things over, I decided to put up a page that was dedicated to just such speculation, and here it is!

The Tom Swift Jr. series is composed of the following volumes:

1. Tom Swift and his Flying Lab (1954)
2. Tom Swift and his Jetmarine (1954)
3. Tom Swift and his Rocket Ship (1954)
4. Tom Swift and his Giant Robot (1954)
5. Tom Swift and his Atomic Earth Blaster (1954)
6. Tom Swift and his Outpost in Space (1955)
7. Tom Swift and his Diving Seacopter (1956)
8. Tom Swift in the Caves of Nuclear Fire (1956)
9. Tom Swift on the Phantom Satellite (1956)
10. Tom Swift and his Ultrasonic Cycloplane (1957)
11. Tom Swift and his Deep-Sea Hydrodome (1958)
12. Tom Swift in the Race to the Moon (1958)
13. Tom Swift and his Space Solartron (1958)
14. Tom Swift and his Electronic Retroscope (1959)
15. Tom Swift and his Spectromarine Selector (1960)
16. Tom Swift and the Cosmic Astronauts (1960)
17. Tom Swift and the Visitor from Planet X (1961)
18. Tom Swift and the Electronic Hydrolung (1961)
19. Tom Swift and his Triphibian Atomicar (1962)
20. Tom Swift and his Megascoppe Space Prober (1962)
21. Tom Swift and the Asteroid Pirates (1963)
22. Tom Swift and his Repelatron Skyway (1963)
23. Tom Swift and his Aquatomic Tracker (1964)
24. Tom Swift and his 3D Telejector (1964)
25. Tom Swift and his Polar-Ray Dynasphere (1965)
26. Tom Swift and his Sonic Boom Trap (1965)
27. Tom Swift and his Subocean Geotron (1966)
28. Tom Swift and the Mystery Comet (1966)
29. Tom Swift and the Captive Planetoid (1967)
30. Tom Swift and his G-Force Inverter (1968)
31. Tom Swift and his Dyna-4 Capsule (1969)
32. Tom Swift and his Cosmotron Express (1970)
33. Tom Swift and the Galaxy Ghosts (1971)

In the following pages you can find reviews of these books.

#1. Tom Swift and His Flying Lab (1954)



Summary: The following summary was extracted from the dustjacket of this book and e-mailed to me by Christopher Pepin. Thanks!

This brand new series of adventures for boys introduces Tom Swift Jr., son of the famous inventor of a generation ago. Young Tom is now an inventor in his own right. As an associate in his father's great enterprise at Shopton, his brilliant mind is seething with the inventive genius that will make him even better known than his father.

In this first exciting book of the new 'TOM SWIFT JR.' series, Tom's gigantic flying laboratory will carry you faster than sound into a thrilling struggle against a gang of international enemies. Tom must overcome the scheming of this game as well as terrific mechanical problems to build his fabulous aircraft, which will soar straight up from the ground, fly at supersonic speeds, and carry scout planes in its own hanger.

When the Sky Queen is completed, Tom and his friend Bud Barclay take off for South America where the same enemies are seeking to gain control of a mountain of uranium. The tense action of their adventures fills every chapter.

Each scientific detail of this fascinating story has been carefully checked. Tom Swift's inventions may be years ahead of the time, just as his father's were in their time, but they are all plausible and some day you may see them in use.

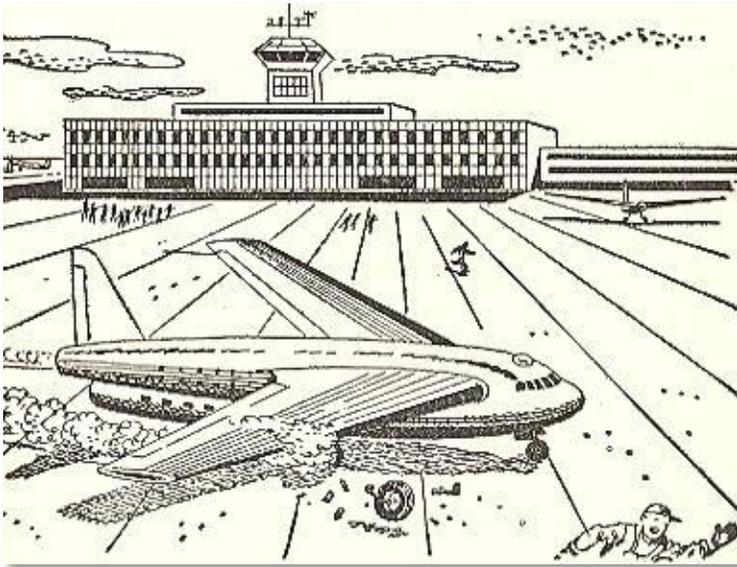
Major Inventions

The biggest invention in this book is, of course, the **Flying Lab**. The Flying Lab a 3 story atomic-powered aircraft that is completely outfitted with all the equipment a scientist could ever need. Jet lifters provide an easy way to land in tight spots, and atomics give it almost unlimited range. The Flying Lab is completely coated with **Tomasite**, an extremely tough, hard, lightweight plastic that can absorb most cosmic rays. Tom uses the Flying Lab whenever he needs to travel cross-continently.

How does the Flying Lab work? The Flying Lab works like all other aircraft. This one, however, has a cruising speed of 1,200 miles per hour and seems to have no maximum altitude (different books, such as #30, sight him at flying at 400,000 feet).

How feasible is it to build a Flying Lab? It is not only entirely possible to build ships with the capabilities of the Flying Lab, but such ships have already been built. NASA, for instance, recently bought a huge "Supper Guppy" from Europe that it plans to use to ferry enormous pieces of the space station around the country. The Air Force has its Harrier Jump Jet, which can duplicate the VTOL (Vertical Takeoff and Landing) capabilities of the Flying Lab.

However, the Flying Lab does have one thing that the others lack: a nuclear propulsion system. The reason for this is simple: what would you do with the radiation?



If you built a Flying Lab, how much impact would it have on civilization?

The Flying Lab would have a large range of uses, mostly because of its enormous size, range, and speed (at 1200mph it can break the sound barrier, and due to atomics it could circle the globe several times without needing refueling). The Air Force would undoubtedly want one, and I'm sure that the scientific community could find some uses for it as well (it would be great on safari's, for example, or on polar expeditions). Commercial aircraft carriers might want a few for those long Tokyo-London or London-Sydney routes. The cargo business might buy a few as well and utilize its enormous carrying capacity.

In short, while it would have a lot of uses, it wouldn't really revolutionize the world. Its atomic motors, however, would be another story...

Another major invention is the **Electronic Amulet**, a device that prevents a person from setting off Tom's special alarm system. Tom's alarm system protects both Swift Enterprises and his home; it is unknown whether the Citadel also has the system. The Amulet, of course, is used in all the Tom Swift books and generally does its best at keeping intruders out (although invariably the enemy has some method to thwart it).

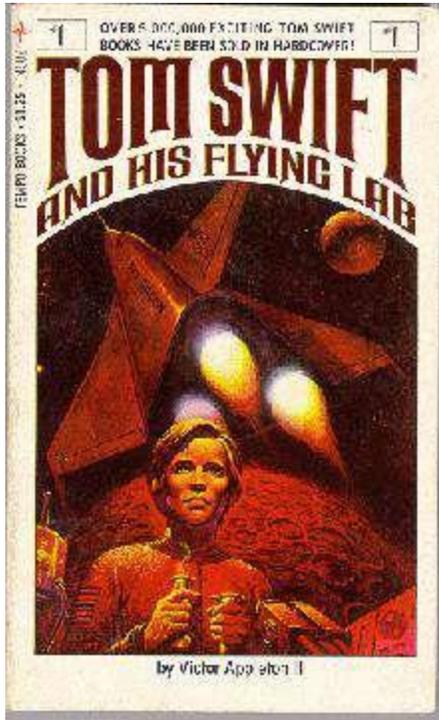
How the Electronic Amulet works: In the words of Tom Swift:

"It sounds complicated, but it's really simple," Tom explained. "The little bracelet traps radar impulses and keeps them off our scopes. There's a giant scope on top of the main building now for everyone to see, and a special one down here in the office for the underground hangar. So," Tom went on, as Chow looked perplexed, "anyone who doesn't

wear an amulet causes a little dot of light to show up on one scope or the other. That's how we can tell if a spy has sneaked in."

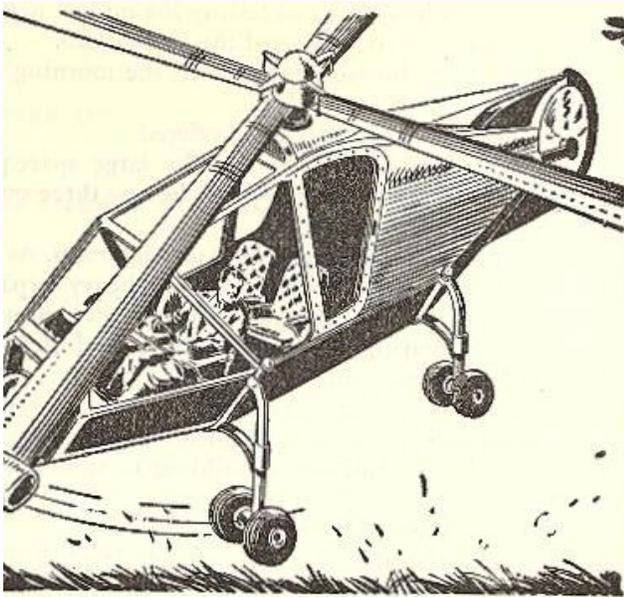
How feasible would it be to build an Electronic Amulet? The Amulet must have been very hard to create. No material (that is, no unclassified material) is currently known that can absorb radar impulses with any kind of efficiency. Still, I suppose it is possible that, given enough time in money, someone could create such a metal. It would still be mighty hard to do, though.

The amulet system does have one major problem, though. You see, unless you used a different radar beam and a correspondingly different material for each amulet system any amulet would be able to defeat any alarm system. Supposedly Tom Swift had a way to combat this, since we never heard of anyone using a plant amulet to sneak into the Swift's residence.

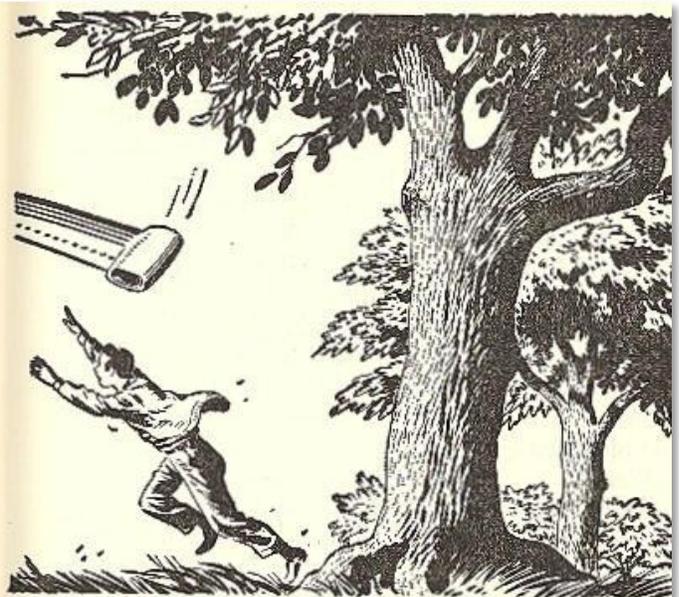


How much impact would it have on civilization? The amulet and the security system it is a part of would probably have a minimal impact on society, as we already have a lot of perfectly good alarm systems. It might be used in certain sensitive government installations and businesses, but other than that there would probably be no place for it (which explains why Tom never tried to market it).

Interesting side-note: In the book *Tom Swift and his Triphibian Atomicar* Tom gives one of his wristwatches to a tribal chief in Kabulistan. This, as Bud points out, enables them to sneak past the Swift alarm systems!



Bud tried to grasp the edge of the cockpit and



pull himself up, but he missed by inches

Minor Inventions

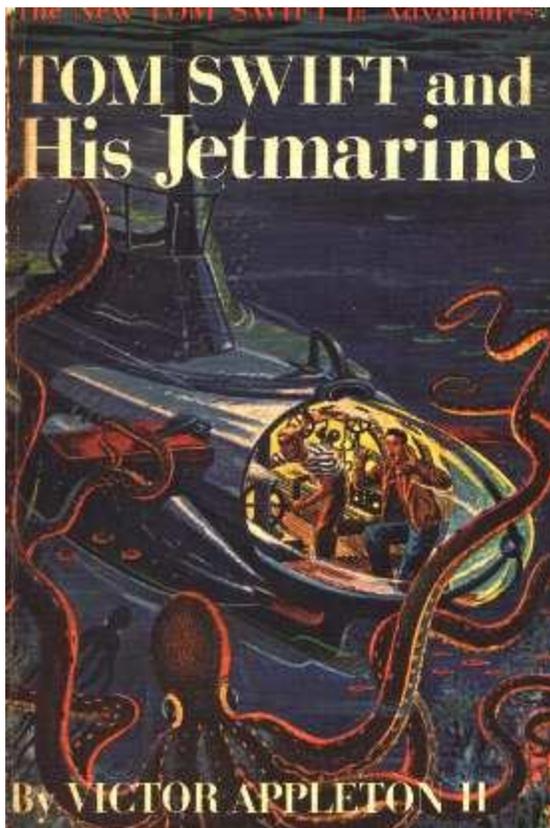
There are quite a few minor inventions in this book:



*The Kangaroo Kub sideslipped toward
the sharp peak*

- the **Damonscope** (named after old Mr. Damon, a very colorful character in the Tom Swift Sr. series who was always blessing something), which can photograph uranium deposits by sensing radiation;
- the **Skeeter**, a midget helicopter (pictured above);
- the **Kangaroo Kub**, a small jet;
- and the **Pigeon Special**, a small commuter aircraft possibly built as a replacement for the Cessna.

#2. Tom Swift and his Jetmarine (1954)



Summary: Extracted from the dustjacket of the book:

The Jetmarine, the second great invention of Tom Swift Jr., takes the young inventor into a desperate battle with bold modern pirates who have been ravaging the sea lanes off our southern coast.

The atom-powered, two-man submarine is launched just in time for Tom and his pal Bud to set out to rescue Tom's father, who has fallen into the hands of the pirates. The wily enemy pulls no punches in trying to wreck the amazing Jetmarine that outspeeds any sub and is able to plunge miles to the ocean floor. Breathtaking running battles through hurricanes and gunfire, thrilling struggles with undersea monsters, imprisonment and escape from the pirate stronghold are part of the excitement of this second book in the new TOM SWIFT JR. series.

From the moment Tom innocently picks up a strange coin imprinted with the head of a dog, things begin happening -- not only to Tom, but also to his father, his uncle, to Bud Barclay, and Chow the cook. The pace continues from the Swift plant at Shopton to the Caribbean -- on and under the sea, in the air and inside the pirates' secret hideout.

Major Inventions

The main invention in this book is, of course, the **Jetmarine**. The Jetmarine, which is Tom Swift's second major invention, is the first in a long line of Tom Swift atom-powered submarines. Tom built the Jetmarine mainly for underwater exploration, but in other books it mentions using Jetmarines to ferry cargo (which, actually, is an interesting idea).

How does the Jetmarine work? The basic principles behind the Jetmarine are the same as for any other submarine ever invented. The Jetmarine is basically a hollow steel shell that's just light enough to float on water. Weighed down with ballast, the sub sinks; drop the ballast and the sub rises to the surface. Once underneath the water, propellers (or in this case, jets of water) steer the ship.

It should be pointed out, however, that Tom's Jetmarine has a design flaw. See that big transparent nose on the front of the ship? Well, despite the fact that the material used in that nose is stronger than steel, the nose still presents an overall weakness in the ship. Designers have found out that it's best to have a ship made out of one material -- having two substances joined together like that creates a potential hazard at that joint. Besides, why have a huge glass nose in the first place? You don't need something that large just to have a good view, and no one steers by sight underwater -- not only is it too dark, it's plain safer to use sonar.

Some passages from the book on the submarine:



"Tell me more about this latest invention of yours, Tom. I'd like to get the full pitch on the Jetmarine and help you try it out, since we'll have to wait a while for our rocket trip into space."

Tom's two-man submarine was to be manufactured and sold eventually as a speed craft for safe ocean travel, especially to distant points such as Africa and Australia. This type of travel would avoid the delays sometimes experienced by surface ships and aircraft during bad weather.

The submarine was to operate on an entirely different principal of propulsion from the standard propeller type. A stream of water forced through special tubes under great pressure would be its means of propulsion.

"A hydraulic jet," Tom explained.

"Give it to me in first-grade science," Bud begged.

Tom laughed. "Remember when we were kids and filled balloons with water, then let go of them? Same kind of propulsion."

"But all I got was a soaking!" Bud remarked. "Go ahead, professor."

The young inventor explained further that the submarine had an atomic pile containing Swiftonium, the radioactive isotope that the Swifts had discovered in South America. In order to protect the occupants of the Jetmarine from the deadly radiation, the whole power plan had been encased in a three-inch thickness of Tomasite. This was a strong, durable plastic named after the young inventor and his father. Heat resistant, it absorbed gamma rays much more efficiently than lead shields, which are ordinarily used.

"Sounds terrific," Bud reflected. "Go on."

Tom said that the submarine, except for its transparent nose, was double-hulled."

"As I see it," Bud interrupted, "The construction of this sub is just like sticking a cigar into one end of an egg and leaving a little of it protruding."

"Right. Only the part of the cigar that you can see is as clear as glass," Tom replied. The nose is molded of transparent Tomasite."

The outer hull was also painted with Tomasite, to prevent reflection of sound waves. Thus, sonar devices could not detect the Jetmarine.

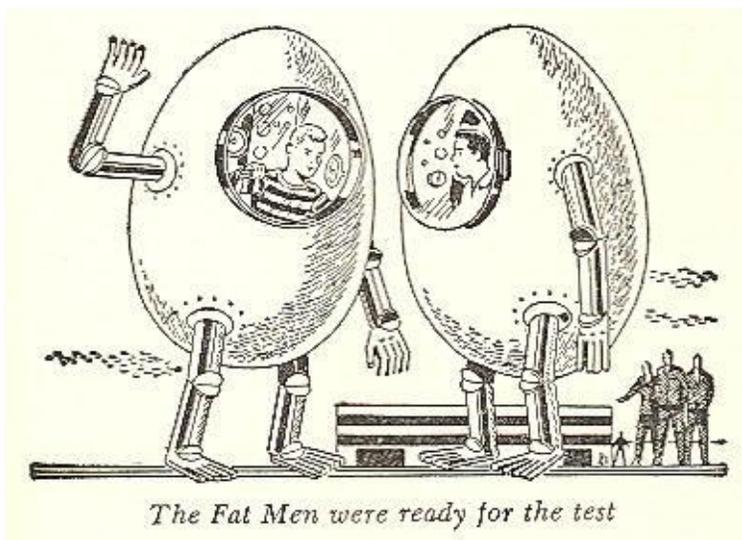
"This is wonderful, genius boy," said Bud, grinning. "But you still haven't told me why makes the Jetmarine go."

Tom laughed. "I haven't? Well, the intense heat from the atomic pile will create steam to drive a turbine, which in turn will activate a pump. This will force out a jet of seawater so fast that it will cause propulsion.

"One thing at a time, skipper," Bud pleaded, "Just how do you control the speed?"

"It's regulated by a battery of cadmium rods. They control the rate of fission when they're inserted or withdrawn from the atomic pile. The deeper the rods are inserted into the pile, the less the heat energy. The more the rods are withdrawn, the faster we generate power.

What about the Fat Man suits? Tom Swift's father wanted Tom to invent a way to escape from the Jetmarine in case something went wrong. Tom Swift complied by creating his Fat Man suits, which he uses over and over and over again in other books.



Basically, the Fat Man suits were just like miniature, one-man submarines, except they were equipped with arms and legs to enable great maneuverability and dexterity. These miniature subs were completely equipped: they had a recyclable oxygen supply, a propulsion system, and a ballast system. Tom got a great deal of use out of these creatures, mainly for retrieving underwater objects or underwater construction.

Some passages from the book on the Fat Men:

Tom smiled. "I've been working on that as a secret project. Bud has dubbed the suit the Fat Man."

Tom briefly outlined the principal features of the metal Fat Man. The body of it was egg-shaped and was five feet in diameter at the center. Inside an operator's seat had been built, surrounded by a number of instruments. There was also a quartz vision plate. This window would serve as entrance to the Fat Man.

Tom pointed out that the suit was propelled by air pressure and was equipped with small ballast tanks, which would enable it to be manipulated like a tiny submarine. Two such Fat Men were to be installed in the Jetmarine next to the decompression chamber, which had been designed to be opened either from the inside or the outside.

Mr. Swift listened intently as Tom continued, "But my main innovation, Dad, consists of the Fat Man's pantograph arms and legs. Hands and feet, too. I work them on button controls from inside. They're almost human."

The elder inventor raised his eyebrows. "How do you keep this gimmick from falling over?"

"Gyroscope!" Tom replied. "An automatic balancing brain."

...

"The lithium hydroxide," said Baker, "is taking care of what the boys are exhaling. And that excellent gadget by which Tom is getting oxygen from the water is a great invention, harder to perfect than the sub itself. If anything should happen to the Jetmarine, they would be able to live in the suits a long time."

What was Tom Swift's biggest problem in designing his Jetmarine? Corrosion. Salt water is famous for its ability to corrode and rust nearly every material known to man. Tom Swift had to think of a way to keep the internal parts of his sub safe from the corroding influence of the water, and he did. How? Well, according to the book...

"Tom, there's not a sign of corrosion on the inside of that test jet engine you've had in the salt-water bath," he said. "That osmiridium you sprayed on the pipes did the trick. Someday let me know just how much osmium and how much iridium you used in the formula, will you?"

"Okay. I'll do that."

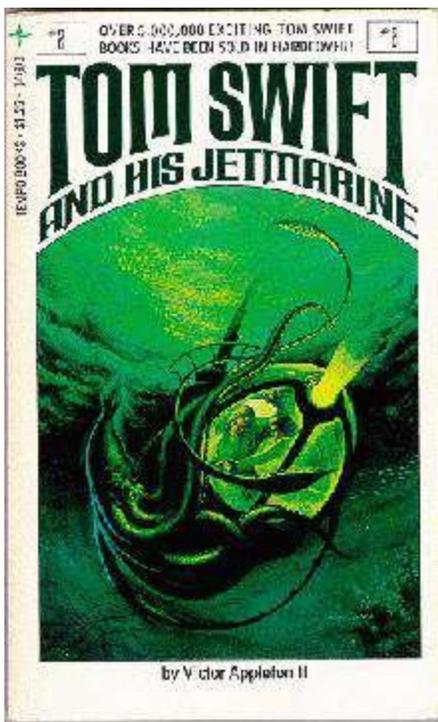
Tom was thrilled. Now he could keep the hydraulic jet engines of the submarine working indefinitely without the danger of corrosion from seawater. The young inventor had worked hard on this problem. He knew that even stainless-steel pipes would not hold up; that paint could not withstand the intense heat; and that rubber would insulate the seawater from the nuclear reactor and prevent good heat transference.

After figuring out the alloy osmiridium, Tom had distilled it into the Jetmarine by a super-high vacuum so that every exposed surface of the machinery was protected.

How feasible is it to build a Jetmarine? Well, if you're willing to drop that bit about the transparent nose, and if you're willing to accept a normal engine, it isn't any trouble at all. In fact, submarines that can work at the Jetmarine's depth and still hold two men do exist today (remember the submarine *Alvin* that went down and looked at the Titanic?)

Basically, though, the dream behind the Jetmarine -- being able to easily and comfortably cruise deep beneath the sea -- has yet to appear. The reason for this is quite simple: pressure. It's currently impossible to build a large, comfortable sub that can dive miles beneath the sea -- even if we used the best materials out there today the sub would still be smashed flat.

It's not that the task is impossible, though. Scientists are constantly designing better materials, harder alloys, and stronger construction techniques. One day a true Jetmarine will be built -- but it won't be soon.



How much impact would a Jetmarine have on civilization? A true Jetmarine, capable of diving miles beneath the sea, would definitely find at least a few buyers. Oceanographers would probably love to get their hands on a true deep-sea submarine. The military would like to have some too, I'll bet.

It's the materials and techniques used to build the Jetmarine, however, that will find the biggest market. Any alloy suitable for undersea travel would probably be very useful in other high-stress environments (i.e. space travel, aircraft, drilling), and any really strong alloy can always be put to good use. The construction techniques, if adapted, could also be used in developing undersea oil rigs and deep-sea mines -- and thus finally give us a way to tap the large mineral reserves located deep beneath the sea and just out of our reach.

I must say, however, that Tom's main reason for building the Jetmarine (that is, using it to transport passengers) just doesn't hold water. Maybe back in the 50's transatlantic transportation was a problem, but it sure isn't anymore. Even if storms were still a problem (which they aren't -- modern planes can just fly above the storm) submarines are just too slow to be used for ocean travel. Speed is the

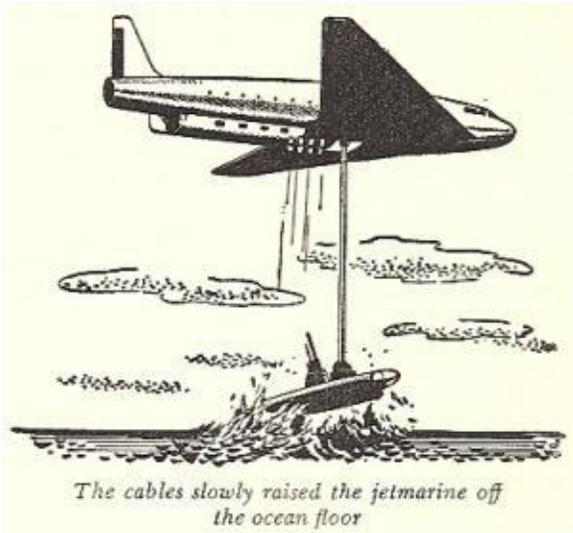
buzzword of the day, and, frankly, the Jetmarine doesn't have it.

Finally, I'd like to mention three other things mentioned in the book that I don't have time to cover in detail: the blackout ray, the remote control car, and the rescuing of Tom Swift's Jetmarine.

In the book, the bad guys invented an amazing machine that could generate rays that were capable of knocking people out cold for some time. The enemies installed this ray on an aircraft and used it to loot ships and cargo (and Tom Swift, of course, had to create an antidote). Now, I won't go into the possibilities of creating such a knockout ray, but I did want to point out the tremendous fallacy in Tom Swift's anti-ray. In the book, when Tom Swift heard about the attacks, he remembered the "pulsator" (on which, curiously, no details were given) he was working on for the government. Tom recalled that he could create a ray that would jam his pulsator, so he decided to mount this machine on the Jetmarine to see if it could stop the enemy pirates.

Now that, to put it mildly, is not the way to handle things. Light waves just cannot be stopped like that. If you can jam one frequency (which, by the way, is quite difficult), the same equipment will be completely useless on another frequency. What Tom really needed was a machine that could detect the frequency and create an anti-beam (as was done in the Rick Brant book *The Whispering Box Mystery*). Maybe the book was on a tight deadline; I just don't know. In later books, though, Tom created anti-devices with a bit more care, so perhaps he learned his lesson. =)

Secondly, in the book, Tom needs to transport a dummy Jetmarine across the country. To do this, he creates a remote-control truck and installs the controls in a vehicle that *follows* the truck. Now, tell me, how is this going to work? Say an obstacle is in front of the truck, or say the truck needs to change lanes. I suppose they could do it with a video camera, but it would definitely be a two-person job (one person to drive the car, one to drive the remote-control truck) and it would definitely not be easy. Somehow, I think that there could have been a better solution (why not just put someone in the truck? Why not have the truck drive itself?)

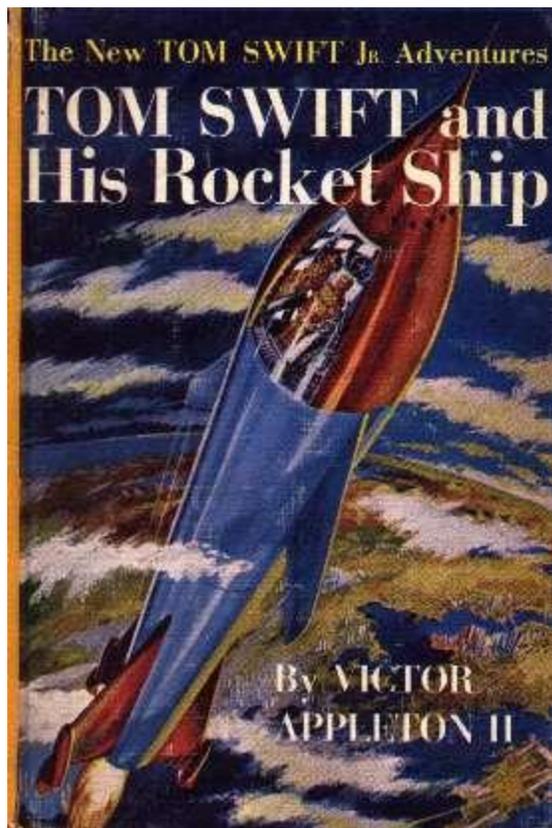


The cables slowly raised the jetmarine off the ocean floor

Finally, in the book, Tom Swift's Jetmarine is rescued by a device his father had created many years ago -- a **Giant Magnet**, or Electromagnet. The story behind this invention can be read in the book Tom Swift and His Giant Magnet. It's neat, I think, that the book

explicitly comes out and says that the Giant Magnet Tom used was invented by his Father. It's kind of a nice touch.

#3. Tom Swift and his Rocket Ship (1954)



Summary: Extracted from the dustjacket of the book:

The third volume of the new TOM SWIFT JR. series takes the brilliant young inventor into outer space in a rocket ship of his own design.

On Fearing Island just off the Atlantic Coast, Tom's space craft project attracts the attention of the spies and agents of a foreign scientist whose plan is to rule the world *and* space.

Tom Swift's advantage over his competitors is that he has perfected a rocket fuel which can carry his ship into and out of orbital flight. But it takes all of Tom and Bug's ingenuity to outwit the ruthless efforts of the foreign scientist and his desperate gang of henchmen.

The flight through space makes thrilling reading--the more exciting because you know the details of the flight are scientifically accurate.

Readers of TOM SWIFT JR. AND HIS FLYING LAB, the first book of this new series, will recall the message that came in the shape of a meteorlike object falling into the Swift plane enclosure. In this story another message from the same mysterious source proves very valuable to Tom as he is flying through space.

Watch for the next TOM SWIFT JR. adventure which will be out soon!

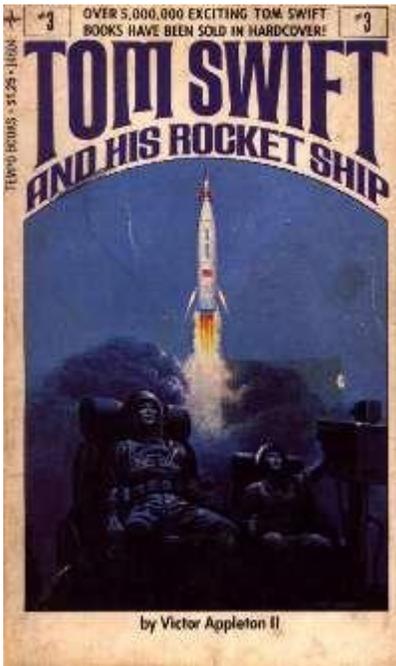
Major Inventions

This book has a large number of important innovations: the *Star Spear*, the robotic drones, Fearing Island, and many more. Since there are so many interesting topics, I have divided this page into a number of sections, with each section discussing a particular invention. I realize that there aren't any pictures; I'll try to come back and add them later.

The Star Spear

The major invention in this book is Tom Swift's rocket ship, the **Star Spear**. The *Star Spear* was Tom Swift's entry to the international space race: he hoped that his new rocket design, armed with a special fuel he had invented, would enable him to be the first man to orbit the earth and claim the International Rocket Society's prize. Not coincidentally, Tom was also hoping his rocket would keep rogue nations from building a "platform in space" and ruling the Earth from it...

Why did Tom Swift build his Rocket Ship? As I just said, Tom built his rocket ship so that he could enter the International Rocket Society's world-wide "race into space." The Rocket Society had posted a \$100,000 prize for the first person to pilot a rocket into space and circle the Earth in a two-hour orbital flight. The \$100,000 prize was a mere pittance compared to the enormous cost of developing and building a rocket, but the prize was still important: the first nation that orbited the Earth would gain enormous prestige -- and the military 'high ground' should another war break out.



What about the rocket launching pads? Tom built a launching pad on Fearing Island to launch his rocket from. The pads had a concrete base and metal scaffolding. An elevator (large enough to carry three people at once) carried passengers 130 feet to the nosecone of the rocket.

How did Tom solve the problem of lift-off G forces? When a rocket was launched in the old days (or even today in some parts of the world) it subjects its astronauts to titanic G-forces: enough force where, if it is not properly taken care of, it could squash the astronauts flat and kill them long before they ever got into space. To solve the liftoff problem, Tom took the same approach later used by NASA: he designed special hydraulic suits and liftoff couches that helped both relieve pressure and spread it evenly over the body.

That wasn't all Tom did, however: he also invented a mysterious device called an "anti-G neutralator." Somehow the device actually reduced the force of gravity on board the rocket ship. Tom later used the device in his other rockets (like the *Challenger*) both to reduce gravity and to provide an artificial gravity field. No word was ever given on how it worked; evidently Tom regarded it as a top-secret invention and kept the plans to himself.

What about atmospheric friction? A rocket flying through space beyond the speed of sound creates a lot of friction with the surrounding air. This friction is a serious problem: the supersonic SR-71 Blackbird had to be built out of titanium because ordinary steel would have been liquefied by atmospheric friction. To guard against this problem, Tom coated both the inside and outside of his rocket with his amazing heat-resistant Tomasite he had developed in an earlier book.

What did the rocket look like? Here is what the book said about the appearance of the rockets. It turns out that the rocket didn't quite match the one depicted on the cover -- that enormous glass window the cover depicts wasn't there, for example. But since when does anyone give out accurate drawings of top-secret equipment?

Before the visitors loomed two gigantic rocket ships about a quarter of a mile apart. Each was painted silver gray with a red nose and at the base were three red fins on which the rockets seemed to be poised...

When Sandy said that she would like to see what the rocket motors looked like, Bud lowered the elevator car down to the launching platform underneath the ship. Both girls gulped at the maze of fuel pumps, pipes, tanks, numberless propulsion motors and platforms...

"But you don't have any windows in here!" Phyl exclaimed. "Aren't you going to be able to see anything?"

Bud smiled at her evident disappointment and said, "We do have tow portholes, but it can be pretty dangerous to take a peek."

He walked over to the wall and opened a circular steel shutter, exposing a good-sized porthole in which was set an extremely thick pane of orange-colored glass.

"Tom tells me that the glass in there will absorb most of the ultraviolet light, but even so we won't dare look toward the sun."

"You see," he continued, "the blanket of air around the earth protects us from most of the harmful radiation, but out in space the sun's rays are so strong they're deadly. That's why we have these shutters for the viewing ports. But since we have another one on the other wall, we'll be able to look our most of the time from one of them. No, we won't miss a thing," Bud concluded.

"I thought it was dark as night up in space," Sandy remarked.

"True, when you're out of the planet' atmospheres. But we might pick up the lights of spaceships from Mars, for instance," Bud replied. He grinned. "So it will be easy to avoid a crash."

How many stages did the Star Spear have? Tom's rocket had four stages and, as the book explains, and Tom had taken some pains to make sure that all the stages would separate at the precise time:

"This rocket is in four stages and each stage is complete in itself," Bud explained. "The bottom section, or first stage, directly above us drops off first, then the next and the next.

Finally, Tom and I will be in our own flying stage. Now let's go back up to the pilot canopy in the nose. I want to show you Tom's latest safety device."

They huddled in the narrow elevator. Bud pressed a button and the conveyor shot to the top stage. In some ways it resembled a plane, but the girls knew that during the early part of the flight, Tom and Bud would be strapped to a board tilted at a 45-degree angle from the upright rocket. Therefore the controls had been built to be within easy reach of this position.

"See this panel?" Bud asked. "It's Tom's foolproof control. If the first three stages don't drop off by themselves, this electronic attachment will cause an explosion and off they go!"

Sandy and Phyl looked around, awe-struck. This passenger section seemed like such a tiny ship in which to make a trip through space. Commenting on this, they learned that it weighed seventeen tons, or only two percent of the rocket ship's total weight.

"But that's all we need," Bud declared. "The two bottom stages get the rocket up into space. The third is to get it in orbital motion. Our payload-stage motors are only used for braking on the return trip."

What fuel mixture did the Star Spear use? The book mentions two fuels. I'm not sure whether the rocket used both, or if Tom's prototype used one and his final product used another:

Fuel trucks piped the last gallons of liquid oxygen and alcohol into the dummy rocket ship. Mechanics and engineers bustled about, disconnecting fuel lines.

...

...they hurried to the launching area, where great tanks of nitric acid and liquid oxygen were being brought alongside the towering rocket.

How was the Star Spear guided into orbit? One of the hardest things in the world to do is to launch a rocket into Earth orbit. Celestial mechanics is an incredibly complex science: without the aid of computers it would be practically impossible to establish a stable orbit:

Tom Swift was in the nose section, with Bud Barclay watching the young inventor give his flight plan a last-minute inspection. This was an automatic pilot in the form of an unwinding, perforated tape which ran through an electric brain. Metal pins would drop into the punched-out holes and make contact with various controls.

"So you expect this piece of plastic to act as guide during the trip and bring the last stage of this rocket right back to the island?" Bud asked dubiously.

"I sure do," Tom replied. "And when it lands, not even the robot jets will have to guide the rocket in."

At what point in the countdown were the rocket engines engaged? The Space Shuttle, unlike rockets in the movies, engages its engines at roughly T minus 8 seconds. The reason it does this (if my memory serves me correctly) is so that liftoff can occur at T minus zero seconds: it takes those 8 seconds to ignite and "warm up" the engines. Tom's rocket had ignition at zero: presumably, the rocket left the ground some seconds after the countdown was over.

Did Tom have any spacesuits on board the rocket? The early astronauts (unlike the Skylab, Mir and Space Shuttle crewmembers who walk around in shorts and short sleeves) all wore space suits inside their spaceships. Tom, on the other hand, did not: while he did bring along a couple spacesuits for emergencies, an advanced life-support system kept him alive inside his ship. Tom's motivation for doing this is obvious: spacesuits are heavy, cumbersome and complex affairs: it is much easier to move around and pilot a ship without one.

...Tom and Bud now tried on the spacesuits which would be carried in case of emergency. They had been constructed from a tightly woven wire fabric of extremely high bursting strength. The suits were covered on each side with an impermeable layer of a new synthetic rubber, joined together to permit movement, and were absolutely airtight.

Encased in these effective but clumsy garments, the boys would be able to survive exposure to the space void for a period of several hours, should a chance collision with one of the hundred thousand meteorites which fall to the earth daily damage the *Star Spear*.

What was the Star Spear's emblem? All of the missions that NASA ever launched have their own emblem. These emblems were often designed by the crew themselves to reflect the ship's mission. The emblem for the Apollo 11, for example, depicts an eagle clutching an olive branch landing on the surface of the Moon with the Earth in the background.

Tom Swift's rocket was no different: he, too, had an emblem, which he had painted on the side of his rocket:

Tom now told his family and the three Newtons that he had arranged for the rocket to be christened and had chosen his mother to perform the honors.

"Since it wouldn't be safe for you to get close to the *Star Spear* at the time of launching and break the traditional bottle on it," he said, "I've arranged something else. There's a certain button on the tracking platform for you to push. By remote control it will uncover the name and the symbol on the *Star Spear*.

Everyone expressed surprise about the symbol which had been added during the night and hidden by a magnetic disk.

"I've read," Tom went on, "that originally the bottles broken against the prows of ships about to be launched contained waters from the seven seas. My symbol represents the seven large stars of the Pleiades, where I hope to fly some day."

...

Down below, the forefinger of Mrs. Swift's right hand pushed a small button. At once the name and the symbol on the rocket were revealed. Between the two words a bright red spear was piercing a seven-pointed white star. Alongside the lowest triangle on the right were the initials U.S.A. lighted up in red, white, and blue.

How feasible is it to build a Star Spear? When the book TOM SWIFT AND HIS ROCKET SHIP was first published in 1954 there were no ships anywhere in the world remotely like the *Star Spear*. Ten years before the book was published, the Germans had built supersonic missiles called the V2 with which they bombed London -- but the V2 was a far cry from a space-traveling vessel. Sputnik wouldn't be launched for another five years; the space race had not yet begun. Space travel still resided solely in the realm of science fiction -- but as this book demonstrates, it was very prophetic science fiction.

Much of the book is quite accurate. Rocket fuel was one of the biggest hurdles to overcome. Radiation in space was a serious problem that had to be dealt with. Rockets would indeed be computer guided -- and yes, often by the same magnetic tape Tom used. Tom really wasn't so very far off after all...

How much impact would a Star Spear have on civilization? That question, obviously, has already been answered. Today we have rockets -- rockets three times as large as the *Star Spear* that can take men to the Moon and launch satellites beyond the edge of the solar system. These rockets have been costly to build: and yet their benefits have far outweighed their cost.

What would our world be like today without satellites? We depend on communications satellites like the IntelSat series to keep us in touch with the far corners of the world. They enable us to call up a friend 10,000 miles away in a few seconds -- a feat crucial to today's industry but which was unthinkable a hundred years ago. Our meteorological satellites warn us of approaching hurricanes and storms -- imagine all the lives which would have been lost over the years if we had not had advance warning! Perhaps someday rockets yet more advanced will carry men to Mars, the stars -- and beyond.

But with these advances comes a heavy responsibility. Satellites can be used to watch weather patterns -- or they can be used to spy on nations. A rocket that can lift a payload into orbit can also be used as an ICBM. Before the Space Age mankind was incapable of exterminating all life on Earth: now with rockets to play with, that is not only an option but a real possibility should there be an all-out nuclear war. Science can be used two ways: it can help, or it can hurt. It's my hope that we will use our science wisely -- not by throwing away our knowledge and our weapons, as some wish, but by the using of them wisely.

The Pilotless Jets

Another one of Tom Swift's inventions in this book is what I call the **pilotless jets** -- unmanned, robotic drones used to guard the airspace over Fearing Island.

Just what did the Pilotless Jets do? To quote the book:

Each of the pilotless jets carried an amazing mechanism called the landing forcer, an invention of Tom's. This instrument, directed from a beeper box in the control tower, could capture and steer intruding planes to Fearing's airstrip.

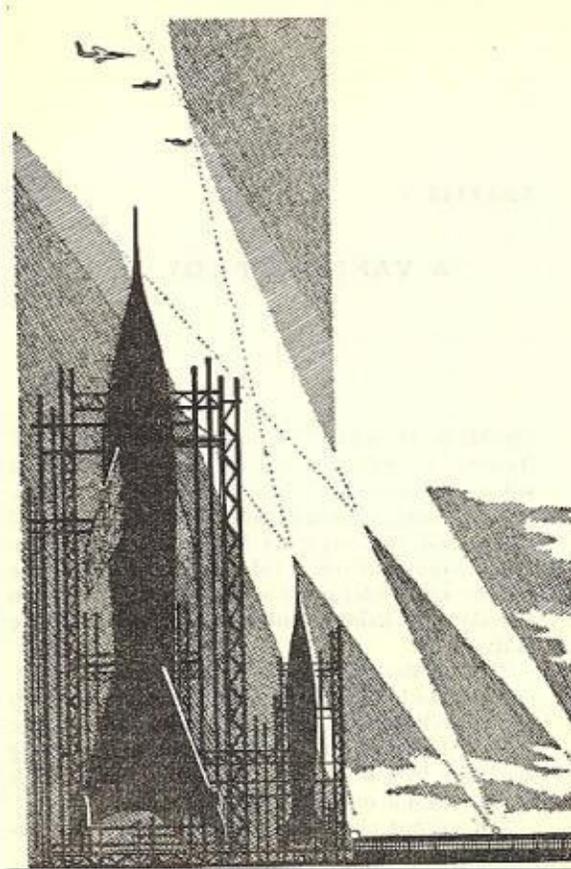


How did the Landing Forcer work? The landing forcer is an amazing invention. I've never heard of anything like it in real life: I have no idea how someone could capture a plane "electronically." Tom, perhaps realizing how sensitive his invention was, stayed tight-lipped about it:

...the enemy pilot was trying to come from the right side. As he completed his turn for the new approach angle, the powerful landing forcer caught the plane in its electronic grip and rolled it violently away.

How easy would it be to build a Landing Forcer? While the pilotless jets exist today (although they aren't quite as easy to built as Tom let on and don't work quite so well), the landing forcer is a completely different matter. I think it would be practically impossible to build one. It reminds me of a tractor beam from Star Trek or Star Wars: it mentions an 'electronic grip' that seems especially powerful... This device would probably be quite useful if you wanted to capture a plane (instead of, say, shooting it down) but I don't think you'll be able to find them in stores anytime soon.

Fearing Island



While not exactly an invention, **Fearing Island** is very important to the Tom Swift series. Fearing Island was given to Tom Swift by the government for Tom's rocket experiments. Tom used it extensively throughout the series for both rocket experimentation and as his primary launching pad for his vast space fleet. The *Star Spear*, Tom's orbital rocket, was launched from this island -- as was Tom's Moon ship the Challenger and his space kite.

How large is Fearing Island? According to the book, Fearing Island is approximately three miles long.

What facilities did Fearing Island have? Fearing Island was much more than a mere rocket-launching complex: it was a whole city in miniature, complete with a laboratory. The facility grew in later years when it became the hub of Tom's traffic into space:

The group drove toward the launching area. Tom's mother and the girls were amazed to see how built-up the island was.

"I had no idea it was so complete," Mrs. Swift commented, as they passed the dock area with its numerous boats and the playfields for tennis, baseball, and other sports.

Then came the long barracks, the construction building, and finally the very modern-looking laboratory building.

The Kicker

One crucial component of Tom Swift's rocket ship was the **Kicker**. The Kicker was the crucial secret that gave Tom's spaceship an edge over all the other entries to the race. It was basically a rocket-fuel energizer: a solar converter that used sunlight to energize his rocket fuel and give him the extra edge he needed to reach Earth orbit.

What is known about Tom Swift's kicker? The book went into a lot of detail to describe Tom's amazing kicker. Here is what the book had to say about it:

The kicker was a rocket-fuel energizer. It consisted of a yard-long section of ten-inch pipe, tapering at each end into the smaller piping of the fuel lines. The bulge was loosely packed with a metallic oxide catalyst and covered at both ends with platinum gauze filters.

Tom's invention, using an alcohol-liquid-oxygen fuel combination, was designed to absorb the hyper-powerful radiation of the sun and shoot this solar energy into the liquid-oxygen supply, converting it into highly explosive, poisonous, blue liquid ozone.

With the help of the kicker, Tom's fuel would be much more efficient than any other combination yet know. In addition to the enormous combustion heat of alcohol and liquid oxygen, he would get additional thrust from the decomposition of the ozone and would decrease mass ratio.

...

He hooked the pump that was designed to carry the liquid oxygen through the kicker. Next, he attached a flowmeter to the pump to register the speed of the liquid.

In rocket flight, oxygen would have to flow through the kicker at a rate of several thousand gallons per minute to satisfy the hungry motors. Should anything interfere with this flow, the rocket would cease to operate and founder in space.

After filling the unit with red-dyed water, Tom squatted in front of the glass window in the pump model to view the flow through the kicker. He flicked on the power and listened to the even whirring of the pump.

"It's perfect" he murmured elatedly, as he watched the scarlet liquid bubbling through the unit.

How did Tom Swift test his kicker? The kicker, of course, had to be tested. To do this, Tom wired it to the top of his plane the *Sky Queen* (also called the Flying Lab) and flew it into the sky to examine its readings:

Tom had installed his invention on top of the great plane and also a highly sensitive thermopile to record any effect of solar radiation on the liquid oxygen. A wire led from the instrument to a thermograph in the laboratory. This would show Tom what was taking place up above.

How high did Tom have to fly to test his kicker? Tom's *Sky Queen* was truly an amazing plane: he flew it 18 miles (about 90,000 feet) high to test his invention. Truly he had an amazing plane -- it must have been its nuclear-powered engines that gave it such an awesome ceiling...

At eighteen miles above the earth Tom asked Bud to hold the plane stationary.

"Why here?" the copilot asked.

"Well, the short-wave-length radiation we are looking for doesn't reach the ground. It's filtered out by the atmosphere between twelve and twenty miles above the earth. We won't get all of it here at this altitude, but enough to predict how well the kicker will work."

When was the kicker set to engage? At 41 miles above the ground:

"Tom, when will that there kicker cut in?" he began.

"It's set to go into action at an altitude of forty-one miles," Tom replied.

"Forty-one!" Chow exclaimed. "Brand my nightmares, why do you wait so long?"

"Well, below forty-one miles there just isn't enough sunshine, Chow."

The Dust Collector

Did Tom Swift carry any experiments on board his rocket ship? As a matter of fact he did: his father built a dust collector that Tom installed on board his spacecraft:

"This invention is designed to catch specimens of mineral particles in space that are perhaps not known on earth," Tom explained. "Dad thinks they might be very useful to us."

"How are you going to hold onto this dust at the rate of speed we'll be traveling?" Bud asked.

Tom smiled and said that the dust would be collected on an electrified field between special copper plates arranged just inside a small opening in the rocket's hull.

"Dad has made the plates so foolproof," said Tom proudly, "that the heat from the sun can't fuse the particles to the plates."

The dust collector was a success; Tom later told his father that it was full of particles from space -- particles of every color of the rainbow.

The Spacelane Brain

Tom tried to consider every possibility when he built his rocket. For example, Tom's ship was controlled by a reel of magnetic tape -- but suppose that it went haywire? Tom wanted to be able to find out where he was and still steer the ship home, so he built the amazing **Spacelane Brain**.

How did the Brain get its name? Usually either Tom or Bud have the honor of naming Tom Swift's inventions. This time, though, Arv Hanson did the honors:

"Tell me, Tom, have you given it a name yet?"

Tom smiled ruefully. "No. I have a harder job naming some of these things than I do figuring them out. Have you any ideas?"

"How about calling it the Spacelane Brain?" Arvid Hanson suggested.

Bud later approved of the name -- he said that it was a great thing to call either the machine or its amazing inventor.

How does the Spacelane Brain work? Unlike the anti-G neutralator, Tom didn't have any hesitation with explaining the details of the invention:

"This navigational equipment is designed only for the rather short distances that we expect to travel at first. When we really get out into space we'll depend more on the radius indicator."

"How does this invention differ from the ordinary aneroid altimeter that we use now?" Hank Sterling asked.

"An altimeter which depends on measuring atmospheric pressure won't work at very low air pressures," Tom replied. "This instrument picks up the noisy cosmic rays from the sun. The nearer the sun, the noisier the waves."

"How accurate is it?" Hanson asked.

"Within a few feet," Tom replied. "Frankly, this part of the instrument is not my own brain child. The idea has been kicking around for some time."

"You dreamed up the navigation part of it?" bud asked.

"Yes," Tom answered. "I took the principle of solar radiation and applied it to the stars. This instrument in the black case picks up the waves from three stars and the rocket's position is recorded on the dial--instantly."

"Let's see it work," Hank Sterling urged.

Tom flicked the toggle switch. A whirring sound began and the needle on the dial moved instantly to seventy-eight thousand feet. Another switch was snapped and five dots appeared on the upper dial.

"The black one at the bottom is the earth," Tom explained. "The three red ones are stars."

"The small one must be the fix--the position," Hanson said.

"That's it," Tom replied. "The point of intersection of the lines from the three stars."

"How do you know which stars are showing on your screen?"

"Each first-magnitude star sends its own distinct sound," Tom explained. "Listen."

Three slightly different beeps were coming from the instrument. From a chart Tom identified them as Deneb, Vega, and Altair.

"The greatest feature of this whole thing," Tom continued, "is that the instrument can be built into the automatic pilot."

"You mean," Hanson exclaimed enthusiastically, "that it makes navigation and steering a single operation?"

"That's right," Tom replied.

"Amazing," Hank Sterling commented. "And it certainly appears to be in perfect working order."

How was it tested? With Tom's *Sky Queen*, of course!

"I'm going up now in the *Sky Queen* to test the new dual-duty cosmic-ray altimeter and stellar sextant," Tom told his friends. "I'll have a distorter rigged up on top of the Flying Lab before it takes off."

How practical would it be to build a Spacelane Brain? I think it would be possible to build such a brain -- but I have strong doubts that it could be accurate within a few feet... I believe that most spacecraft tracking done today is accomplished via a complex radar network. Radar works quite well: I have heard that NASA can track and pinpoint nuts and bolts that are loose in Earth orbit...so there is probably no immediate need for a Spacelane Brain. One day, however, NASA might start sending ships beyond the solar system where radar is impractical -- and then a Spacelane Brain will not only be necessary, it will be critical...

The Extra-Terrestrials

In the first book of the Tom Swift series a group of aliens from another planet sent an asteroid and landed it near Tom Swift's airfield. By the end of the book, Tom and his father had managed to decode the mathematical symbols on the meteor. Now that Tom was planning to launch a rocket into orbit, he decided to take the opportunity to try to send a message back to them:

"I'll rig a powerful receiver into the dummy rocket that may pick up messages sent out by space travelers on a holiday from Mars. One might even be directed on purpose toward our rocket! The transmitter will relay the message down here."

Tom's father had even created a space dictionary so that if Tom did receive any messages he could decode them instantly. These preparations were not in vain: when Tom finally made it into orbit, his space friends sent him a message of congratulations.

The Mechanics of Space Flight

As a final note, the book went into some detail to describe the mechanics of space flight. For those of you who would like to know a bit about orbits and g-forces, I thought I'd end this page by letting Tom explain some of the gritty details of his trip:

Just what is an orbit?

"By the way, Tom, has that there rocket o' yours got a name?"

"Yes. It's going to be christened the *Star Spear*. And she's practically ready for orbital flight."

"What does *orbital* mean?" Chow asked, wrinkling his brow.

"Orbital means a track," Tom replied. **"A thing to go around on -- a more or less circular path."**

Bud added, "A rocket in orbital flight is like a baseball swinging at the end of a string. The path of the ball in relation to your fist will be its orbit."

..."In the rocket we turn off the motors at a certain altitude," Tom said, **"and keep on flying along our orbit."**

"Hm," Chow grunted. **"But after you turn off the motors, what's goin' to keep the lil ole rocket goin'?"** The cook scratched his bald head. **"Why don't she slow down an' tumble right back to earth?"**

"Its centrifugal force exactly balances the pull of the earth," Tom answered. "And there's no mass of air, as we know it here, to interfere with the rocket and slow it down."

What about G forces?

"At ten G's you and I will each weigh a ton."

The cook looked at the boys suspiciously, then said, "Say, Tom what are these lil ole G's you all talk about? They sure got me bothered. It ain't natural. Sounds like gangster talk or the FBI."

Tom laughed at the way the puzzled cook wrinkled his forehead. "Sorry, Chow, you're wrong on both counts. The term G is a unit of measure, like a pound of something or a dollar..."

"The G factor measures the basic attraction the earth has for a unit mass at the earth's surface," Tom continued. Then, smiling at Chow, he went on, "Now in your case, Chow, you have more mass than Bud or I, so the earth loves you more than it does us, and hangs on to you tighter."

Chow snorted and said, "It kin hang on to me just as tight as it wants--the tighter the better!"

Tom and Bud laughed, and Tom resumed his explanation.

"Someday, Chow, bring a bathroom scale down to the plant and put it in the elevator. Weigh yourself, then press the button for the top floor."

"The faster the elevator starts, the more you weigh. Now, if the scale reading was twice as much as it was when you were standing still that would be a force of two G's. When the *Star Spear* takes off, Bud and I may weigh ten times as much as we do right now--that would be a force of ten G's."

#4. Tom Swift and His Giant Robot (1954)



Summary: Extracted from the dustjacket of the book:

When the Swift Enterprises undertakes to set up an atomic laboratory for the U.S. Government, Tom Jr. goes to work on a giant robot that can function by remote control when exposed to deadly atomic and hydrogen rays. The invention intrigues the interest of a band of clever bank robbers who think they can use the giant robot in their work.

How they interfere with Tom's invention by means of flocks of mechanical crows; how a mad scientist joins the robber gang and almost succeeds in destroying the atomic laboratory from within its well-guarded walls; how, one by one, the clever criminals are outwitted and captured by Tom and his friend Bud; how the giant robot is completed in time to perform his part in the saving of the laboratory are all told in this exciting yarn.

Tom Jr. has had many close escapes before, but in this story all of his ingenuity and quick thinking are required to prevent disaster and to save his own life from the fiendish device of the enemy's mechanical crows.

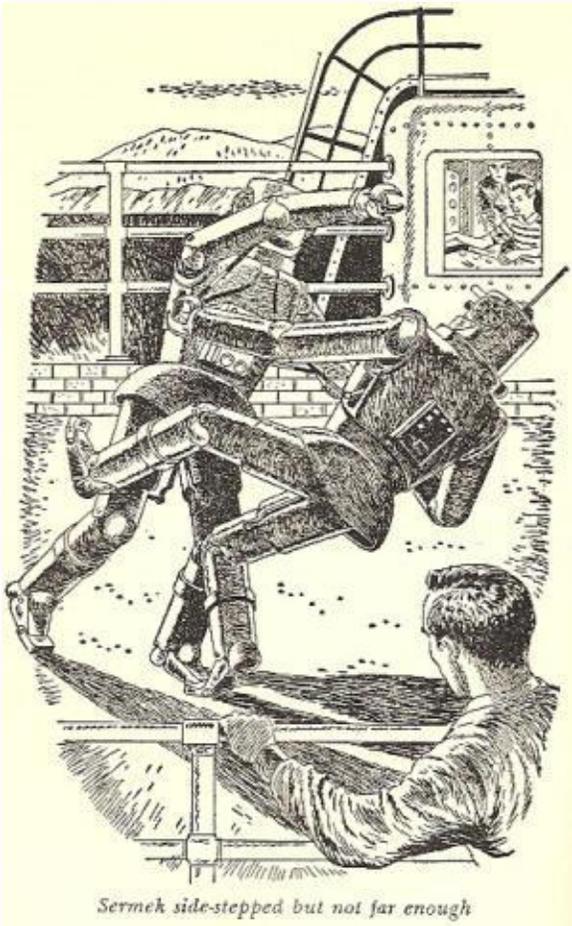
Major Inventions

The biggest invention in this book (in more ways than one) is the **Giant Robot**. Tom built the Giant Robot for one reason: to do repairs and maintenance work in the radioactive parts of his father's atomic laboratory. There aren't a whole lot of details as to how the robot works or is put together, but in general we can get a pretty good idea of the author's ideas. Tom Swift built two robots: the first one was named Ator to represent the fact that he was "both atom and robot"; the second one was called Sermek "in honor of the field of servomechanics".

How does the Giant Robot work? The Giant Robot had two main parts -- its body, and a device called a relotrol. The job of the relotrol was to "relay radio impulses needed to guide the robot working in areas of the plant where the radiation would be fatal to human beings". No information as to how it worked was given, although there was this one little piece on the problem of radiation interference:

"The relotrol will be operated by frequency modulation, just like FM radios. The signals will have nothing in common with radiation and the robot won't be confused."

The robot itself was designed as follows:



Even without its "head", the gleaming, silver-gray automation stood seven feet tall. Tomasite, the young inventor's wonder plastic, covered every part of its frame except the joints. These were enclosed in "sleeves" of fine Tomasite chain mail which stretched and contracted with the movement of the joints.

"I suppose the transmitting and receiving antenna will be in the head?" Mr. Swift asked.

"Right, along with the television 'eyes' and radio 'ears'. After the giant's head is on, he'll be remotely controlled. Right now," Tom went on, pointing to a cable protruding from the back of the robot's neck and running to a control panel on the wall, "I have to use a direct control and monitoring method."

"What can your giant do so far?" Mr. Swift asked.

"Walk, and do almost anything with his hands. Want to see him thread a needle?"

Mr. Swift smiled. "I'd rather watch him walk."

"Okay. Here goes." Tom set the panel for "walking" and slipped the punched take to control

arm and hand motions. He explained that the perforated tapes, which would be used for the robot's various actions and motions, operated on the same principle as a player-piano roll.

The young inventor turned a key to open the relay circuits in the robot and the giant's machinery began to hum. At the same time, its body broke out into a blaze of dazzling colored lights.

Mr. Swift roared with laughter. "A real show with lights. What are they for?"

"I installed bulbs of various colors at the joints to tell me how the circuits are working," Tom explained as he snapped off the laboratory lights.

Mr. Swift chuckled. "Looks like a Christmas tree."

"But who ever saw a *walking* Christmas tree?" Tom grinned. "Watch this!"

He advanced the "walking" dial on the control board a few notches. Slowly the robot lifted his right foot. The foot moved forward, paused, and came down with a crunch. Memory tapes in the control panel sent a signal to the other foot, moving it just far enough to avoid toppling the body. Step by step, the automation moved forward.

...The final assembly of its [the robot's] metal body was taking place and Tom watched as the huge jointed skeleton was set up. Motors were being fastened in place to rigid tubular braces.

To offset the heat generated by the mechanisms inside the robot body, Tom had devised a circulatory cooling system, which was now being installed.

Arvid Hanson, standing near Tom, asked, "How does the cooler work?"

Tom explained that it [the cooler] was a highly paramagnetic fluid that was alternately magnetized and demagnetized at a rate controlled by a thermostat.

"It keeps the robot's inside temperature at 96.4 degrees," Tom added.

"I see," Hanson said. "But what about protection from outside heat--the kind your robot will have to withstand in the atomic energy plant?"

"Oh, I'm using asbestalon," Tom replied. This was a material composed of asbestos fibers in a plastic matrix.

Hanson was shaking his head. "When I make a model of this robot for your office," he said, wincing, "it'll be some job to get that chain mail you're using over the moving joints down on scale."

Another problem faced by Tom was the camera eyes for the robot. Because the robot would be working in intense radiation, the cameras would somehow have to filter out the radiation coming from the atomic pile. If it didn't,

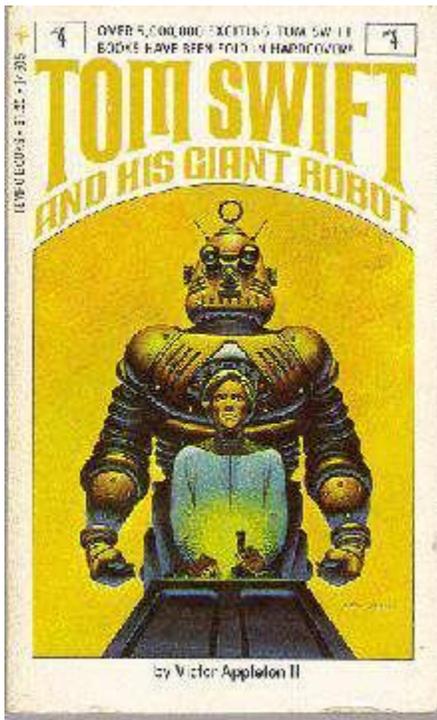
..."the phosphors on the screens of the camera tubes were sensitive to the invisible but powerful radiation produced by the radioactive materials in the pile. This intense radiation would fog the picture on the iconoscope face and literally blind the robot.

...Finally, the young inventor set up a series of mirror light baffles. These caught the visible light and reflected it into the tube while absorbing and deflecting the harmless radiation. Thus the screen was protected.

How feasible is it to build a Giant Robot? From what I understand, there are a number of modern-day Giant Robots on the market. The robots I've seen pictures of in scientific magazines are rather large, extremely heavy, vaguely humanoid, expensive, and somewhat extensively programmable.

Trying to create a duplicate of Tom's robot would present special problems, however, in terms of both maneuverability and radiation. How can you design a robot that maneuverable that will work in areas of heavy radiation? There would, I think, be some problems there. The majority of the problems would be in the robot's maneuverability -- from what I've seen and heard, today's robots are huge, slow, contraptions that must be treated gently. You could never play a tennis match with them, as Tom did, or engage them in a realistic wrestling match. And you can also forget about trying to do any complex chemistry experiments with them -- they just cannot be controlled that delicately.

Still, I'm not saying that it can't be done. Perhaps it could, if there was sufficient demand for such a robot and sufficient expertise to build it. It would prove to be a challenge, though.



How much impact would a Giant Robot have on civilization? It is hard to say if there is a demand for a Giant Robot or not. Perhaps, if one was built, someone could find a way to use it, but it would depend on things like its price, its weight, and fuel demands. Even if it were cheap, though, I think that only a very limited number of them would be sold -- if any.

Why? Simply because most modern day tasks that require robots can be done with ordinary machines or robotic arms. If one needs a robotic solution one goes to a robotics firm, tells them what one needs done, and then the firm custom-builds a machine that can do what one needs it to do. An all-purpose robot that can handle any number of tasks would only sell well if it were cheaper than using a human to do the job.

There is one kind of Giant Robot that might find an enormous number of uses, despite potentially high costs. That would be a robot equipped with a really good Artificial Intelligence system, in other words, the classical Science Fiction robot. Tom didn't invent one of these, though, and I can certainly see why; Artificial Intelligence is not an easy field to deal with.

Another invention that is worth mentioning is Tom Swift Sr.'s atomic laboratory, the **Citadel**. The Citadel, which appears in numerous other Tom Swift books, is an atomic laboratory built and designed by Tom Swift Sr. Its purpose was simple: it was to take normal uranium, bombard it with nuclear particles to transform the uranium to different metals (plutonium, for example), and then separate the metals made so they could be sold.

How does the Citadel work? The book described the plant as follows:

...At last Mr. Swift led them to the main structure, built of white cement. Inside was a corridor extending around four inner walls of lead and concrete. On one of the walls was a relay and television board for messages to and from the robot as he worked in the inner room. The main remote-control panel was in a separate building.

"Tom, I expect your giant to be able to feed slugs of uranium to the oven if necessary," Mr. Swift said.

"He'll do it," Tom assured his father.

"Now we'll take a look at the heart of this building," Mr. Swift said.

In the huge interior section was a mass of square lead and concrete pipes arranged longitudinally.

"Looks like a mammoth honeycomb," Hank remarked. "I suppose the slugs of uranium are fed to the pile through these."

"Correct," said Mr. Swift. "The heart of the reactor is in the center. In there the uranium will be bombarded with neutrons and changed into the various transuranium elements. Then the slugs are taken from the pile and the robot separates out the new elements in his own completely equipped chemistry lab over there." He pointed to an enclosure whose walls were lined with the necessary chemicals in radiation-proof containers. "After that, he prepares them for shipment to medical and scientific institutions."

"And where will the waste products--such as the slug casings--go?" Hanson asked.

"Tom's robot will carry them out through a tunnel to an underground lake we've made. In that way, no living thing can be contaminated by the radioactive waste."

Next, Mr. Swift took them outdoors to a small concrete structure located at a short distance from the pile plant.

"This is where Tom and the other operators will receive reports from the robot and send him orders," Mr. Swift explained.

From the outside the structure resembled a gun pillbox more than a control house. Within, however, the function of the building was obvious, with its large color-television screen, surrounded by loudspeakers and banks of oscillographs. Control knobs and buttons were set into a huge desk-height panel. Hank Sterling and Arv Hanson examined the large racks of amplifiers with interest.

Tom now showed them the tape library. "These tapes will be a real boon to the robot's operator," he said. "They'll do away with the necessity of direct control on routine acts and motions of the robot. In fact, we can feed in any of more than a thousand different tapes

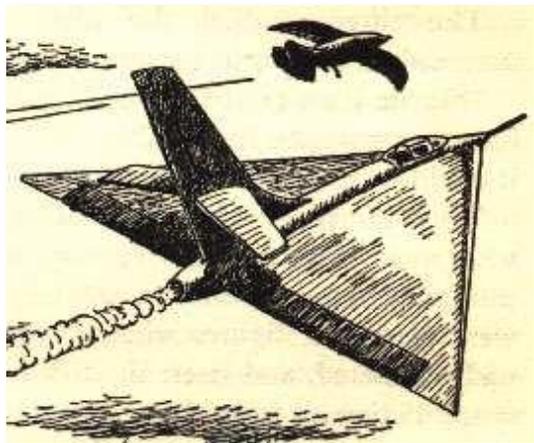
with directions to get him out of every difficulty we've been able to foresee. But when something unexpected comes up, the operator will have to take over."

How feasible is it to build a Citadel? While I have not heard of any laboratories that perform the Citadel's job, I would assume that, somewhere, there is a plant that does exactly what the Citadel does. After all, plutonium is a man-made metal; surely it has to be made somewhere!

Toward the end of the book, a mad scientist tried to blow up the Citadel. Here is how it was done:

..."The pile feeds on slugs of uranium-238, which is nonfissionable. In the pile a portion of it is slowly converted into plutonium. Now if you feed the pile a slug containing a high concentration of plutonium, it could set off an explosion before the moderator material ever had a chance to quench the reaction. I think one of those slugs has been loaded with plutonium."

There is another invention in this book that, while not invented by Tom, is certainly worth mentioning. That invention is called the **Mechanical Crow**. The Mechanical Crow was a small steel remote-control rocket, roughly the size of an eagle, which looked like a crow. It certainly didn't act like one, though -- its main job seemed to be overpowering the guidance systems of Swift aircraft and then hijacking them.



In appearance, it wasn't much -- just a simple rocket with a few attachments that served to make it look like a crow. It didn't look terribly convincing, but I suppose it didn't have to be -- just as long as the pilot was momentarily fooled, the design was good enough.

The inventor of the crow put in a very thoughtful precaution -- dynamite. A simple "seepage-diffusion chemical time fuse" set off the dynamite. The dynamite didn't keep Tom from probing the secrets of the mechanical crow, but it did make things exciting!

According to Tom, the crow had a rather unusual design. The crow's radar was located in its 'feet', with the crow's talons serving as a meshed radar screen. There were a number of other features in it -- a coordinator, a unique gyroscope, and some other equipment that the book didn't go into any details about.

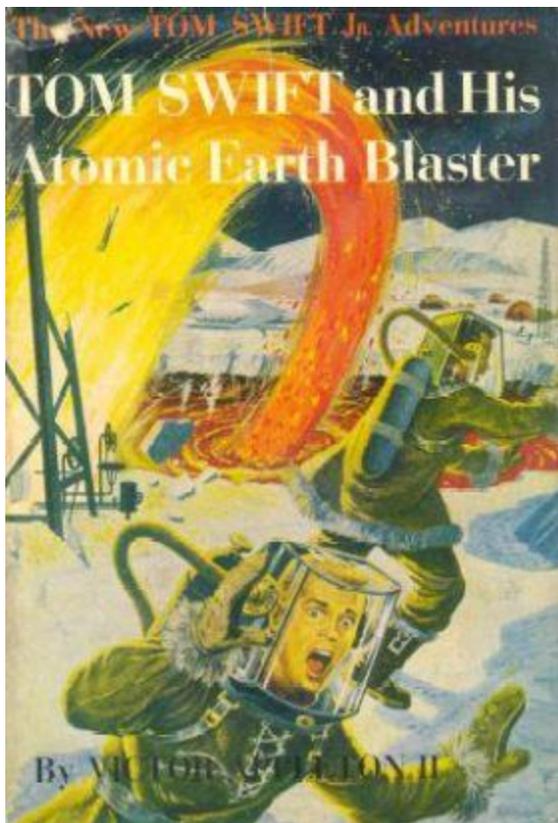
Personally, I have my doubts as to the possibility of building a mechanical crow. Just how does one overpower the navigational system of a plane with electronics and radio signals? Perhaps, given enough time and money, it could be done, but I have *very* serious doubts. If its job was to confuse or destroy a

plane's navigational system, sure, I could see that happening (remember the warnings on aircraft to turn off all electronic devices shortly after takeoff and shortly before landing?). But to take it over? With something that small? I don't think so.

A Parting Word

This book is one of the few books that pays homage to the Tom Swift Sr. series. Early in the book, when Tom is sitting in his Father's office, it says: **"Back of Mr. Swift's desk hung pictures of faraway places the elder inventor had visited in his younger days. Beside him, in a vast glass cabinet, were bronze models of a dirigible, a great searchlight, a war tank, and a model of a small motorcycle."** All of the machines that Tom saw bronze models of figured very highly in some of the Tom Swift Sr. books -- books such as Tom Swift and His Motor Cycle, Tom Swift and His War Tank, Tom Swift and His Big Dirigible, and Tom Swift and His Giant Searchlight.

#5. Tom Swift and his Atomic Earth Blaster (1954)



Summary: Extracted from the dustjacket flap of the book:

Furious Antarctic storms and ruthless enemies stalk Tom Swift Jr. And his latest atomic invention, the earth blaster, in book number five of this thrilling science-adventure series.

When Tom chooses the South Pole as the spot to hunt for molten iron with his earth blaster, his closest friends raise their eyebrows. Even Chow Winkler, the expedition's genial Texan cook, says, "Brand my thermopile, if the young inventor ain't plumb loco!"

First Tom has to convince the skeptics about the value of his earth blaster. Preliminary tests prove that it is one of the greatest inventions the world has ever known.

When spies of the Kranjovian government learn about the project, it becomes a race to see who will reach the South Pole first. Tom risks his life and all the funds of Swift Enterprises to launch the expedition. With his pal Bud Barclay, Chow, and a group of top-flight technicians, he braves the white fury of the Antarctic ice barriers to set up operations. But the Kranjovians seem to have beaten him to

it!

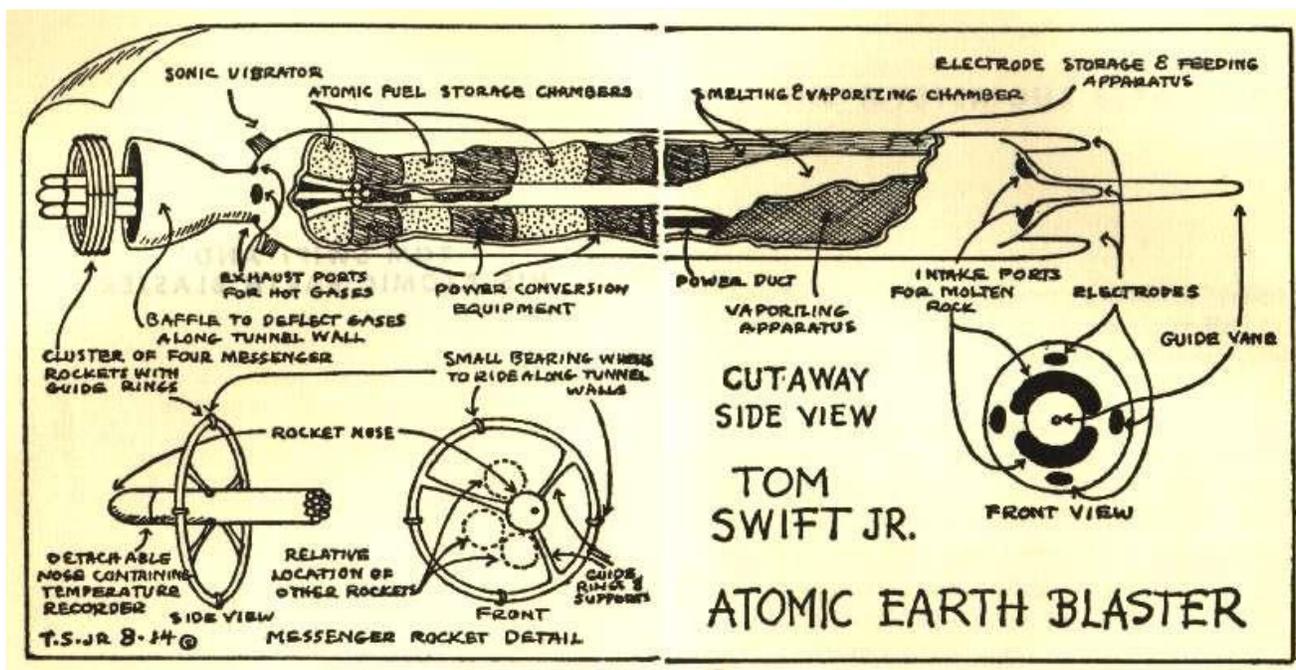
In the nerve-racking and chill-packed days that follow, the young inventor is faced with one of the greatest challenges in his career. The outcome hangs in the balance down to the last page of this dynamic story. Read it to see how Tom Swift Jr. startles the world when his atomic earth blaster starts the most phenomenal gusher known to man!

Major Inventions

(The summary below was written by Graeme Woods. Thanks again for volunteering!)

The most important invention in this book is the **Atomic Earth Blaster**. The Atomic Earth Blaster is an automated tunneling machine. Tom builds a prototype version that uses mechanical cutters to grind up rocks and dirt before progressing to the final model that uses atomic energy to vaporize rock. The Atomic Earth Blaster is used to drill down to a molten layer of iron deep beneath the earth's crust.

How does the Atomic Earth Blaster work? This book is unique in my collection of Tom Swift books in that it includes a diagram of the Atomic Earth Blaster:



The mechanical Atomic Earth Blaster is nuclear powered, but uses traditional grinding tools to cut into rock. This is similar to existing tunneling tools except that it uses nuclear power. However it appears to be a lot faster, as most tools of this type cut quite slowly.

The vaporizing blaster is different as Tom describes to Chow:

"That sure is a mean-lookin' contraption you got parked outside!" the cook added. "Is that what you're diggin' through to China with?"

"Not exactly." Tom grinned. "That's only my experimental model. The blaster we take down to the South Pole will be somewhat different."

"How different?"

"Well, look at these drawings. Instead of those digging devices you see sticking out the front end of our experimental model, the new one will have four electrodes spaced around the nose and a long guide vane sticking right out of the center."

"What's the idea o' them things?" Chow asked.

"Well, you see, the old model just ground up dirt and rocks mechanically. But on my new blaster, these electrodes sticking out the front will melt any rock on contact. Then the molten liquid will be drawn in through these intake ports, and further smelting will take place inside the machine. The resulting hot gases will jet out through these exhaust ports at the rear."

This is how Tom describes the operation of the blaster in tunneling down to the molten iron:

"Instead of using the atomic energy to grind up the dirt and rocks, we could use it to power an electric smelter. This would release gaseous oxygen from the melted rock. And the gas in turn would billow up the shaft, carrying the particles of ore dust with it so we wouldn't need a conveyor."

The blaster is remote controlled and is launched into the earth from a launching gantry as Tom describes to Mr. Swift:

"Here's a sketch of the launching platform I've designed for the South Pole blaster," Tom said, spreading out a blueprint on his father's desk.

The structure was composed of girders and I beams, and looked somewhat like an upside-down rocket launching platform. Rails were provided to guide the machine on its take-off.

Mr. Swift studied the drawing carefully.

"I believe this will do the trick, all right, son," he commented. "Of course your machine will only have room for a bare minimum of sheathing around the atomic pile, and that will make things much more difficult. It means the launching will have to be done by remote control to make sure you and the others are exposed as little as possible to dangerous radiation"

Tom nodded thoughtfully. "I've already provided for that, Dad." He went on to describe the remote-control system by which he planned to operate the machine.

To withstand the high temperatures, the polar blaster is made of chrome-nickel-moly (although the prototype is made of mild steel to reduce costs). It also has its own cooling system and internal guidance system:

For one thing, he must adapt the cooling system, invented for his giant robot, for use in the earth blaster. This system used a highly paramagnetic fluid which was alternately magnetized and demagnetized. The fluid was circulated through the vacuum tubes inside the robot and controlled by a thermostat to maintain an ideal working temperature of 96.4 Fahrenheit.

A similar system would be needed to protect the instruments in the earth blaster from overheating. A hundred miles down, the blaster would have to operate at temperatures of several thousand degrees - hot enough to shrivel a human being to ashes!

"And speaking of instruments", mused Tom, "she'll need a gyroscope, too." He smiled at the thought of what might happen if the machine ever veered off course.

Would the Atomic Earth Blaster work? Before determining whether the Atomic Earth blaster would work as described, it is interesting to note that several actual prototypes of a similar machine called a

nuclear subterrene have been tested and patented by scientists at the Los Alamos National Laboratory, in New Mexico. Three machines were patented, one in 1972 in the name of the United States Atomic Energy Commission and two in the name of the United States Energy Research and Development in 1975. The information in a subsequent study indicates that work had been progressing since the early 1960's.

Patent no. 3,885,832 shows a machine similar in appearance to Tom's blueprint shown in the book:

United States Patent [19] **3,885,832**
Altseimer et al. [45] **May 27, 1975**

[54] **APPARATUS AND METHOD FOR LARGE TUNNEL EXCAVATION IN HARD ROCK** 3,396,806 8/1968 Benson 175/11
3,693,731 9/1972 Armstrong et al. 175/11

[75] **Inventors:** John H. Altseimer; Robert J. Harold, both of Los Alamos, N. Mex. *Primary Examiner*—Frank L. Abbott
Assistant Examiner—William F. Pate, III
Attorney, Agent, or Firm—Dean E. Carlson; Henry Heyman

[73] **Assignee:** The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

[22] **Filed:** Jan. 25, 1974

[21] **Appl. No.:** 436,401

[52] **U.S. Cl.:** 299/14; 175/11; 299/33

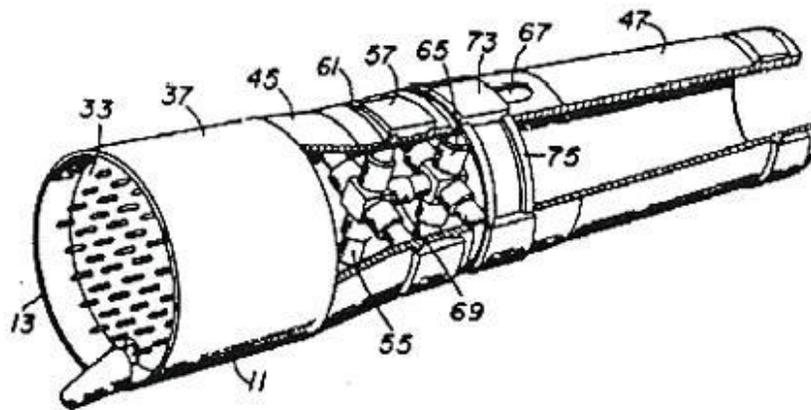
[51] **Int. Cl.:** E21d 9/00

[58] **Field of Search:** 299/33, 14; 175/11, 16, 61/45 R

[56] **References Cited**
UNITED STATES PATENTS
3,334,945 8/1967 Barlett 299/33

[57] **ABSTRACT**
A tunneling machine for producing large tunnels in rock by progressive detachment of the tunnel core by thermal melting a boundary kerf into the tunnel face and simultaneously forming an initial tunnel wall support by deflecting the molten materials against the tunnel walls to provide, when solidified, a continuous liner; and fragmenting the tunnel core circumscribed by the kerf by thermal stress fracturing and in which the heat required for such operations is supplied by a compact nuclear reactor.

3 Claims, 5 Drawing Figures



The earlier 1972 patent, 3,693,731 shows a more needle-nosed machine:

[54] METHOD AND APPARATUS FOR TUNNELING BY MELTING

[72] Inventors: Dale E. Armstrong, Santa Fe; Berthus B. McInteer; Robert L. Mills; Robert M. Potter; Eugene S. Robinson; John C. Rowley; Morton C. Smith, all of Los Alamos, N. Mex.

[73] Assignee: The United States of America as represented by the United States Atomic Energy Commission

[22] Filed: Jan. 8, 1971

[21] Appl. No.: 104,872

[52] U.S. Cl. 175/11, 175/16, 175/19
 [51] Int. Cl. E21c 21/00
 [58] Field of Search..... 175/11-16

[56] References Cited

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3,396,806 8/1968 Benson 175/16 X

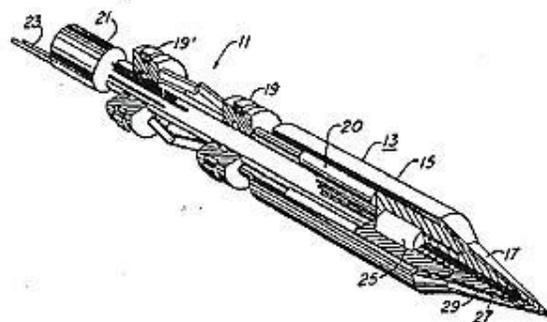
3,117,634	1/1964	Persson	175/94
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3,225,843	12/1965	Orloff	175/94 X
3,357,505	12/1967	Armstrong et al.	175/16

Primary Examiner—Marvin A. Champion
 Assistant Examiner—Richard E. Favreau
 Attorney—Roland A. Anderson

[57] ABSTRACT

A machine and method for drilling bore holes and tunnels by melting in which a housing is provided for supporting a heat source and a heated end portion and in which the necessary melting heat is delivered to the walls of the end portion at a rate sufficient to melt rock and during operation of which the molten material may be disposed adjacent the boring zone in cracks in the rock and as a vitreous wall lining of the tunnel so formed. The heat source can be electrical or nuclear but for deep drilling is preferably a nuclear reactor.

3 Claims, 7 Drawing Figures



The 1972 patent describes:

"a machine and method for drilling bore holes and tunnels by melting in which a housing is provided for supporting a heat source and a heated end portion and in which the necessary melting heat is delivered to the walls of the end portion at a rate sufficient to melt rock and during operation of which the molten material may be disposed adjacent the boring zone in cracks in the rock and as a vitreous wall lining of the tunnel so formed. The heat source can be electrical or nuclear, but for deep drilling is preferably a nuclear reactor."

The nuclear heated subterrene uses a compact nuclear reactor to transfer heat via liquid lithium to a molybdenum nose that melts the rock. In the process of melting the rock the lithium loses some of its heat. The lithium is then circulated back along the exterior of the tunneling machine to help cool the molten rock to form a vitrified tunnel lining. The cooled lithium then circulates back to the reactor where the whole cycle starts over. The alternative approach uses electrodes to melt the rock.

The main difference between the blaster and the subterrene is that the blaster has a second heating cycle that actually vaporizes the rock (converts it from a liquid to gaseous state) rather than just melting it. The vaporized rock is exhausted from the back of the blaster.

Since the melting point of rock ranges from 700 degrees Celsius to 1300 degrees Celsius the boiling point of rock would not be too far above this temperature. I therefore believe that it is possible to make a machine out of materials that would support temperatures that would allow rock to be vaporized. Refractory materials such as carbon and hafnium carbide can withstand temperatures in excess of 3500 degrees Celsius. These temperatures would easily vaporize rock. Tom's cooling system could keep the rest of the blaster at a safe working temperature.



The crew unloaded an atomic earth blaster

A carbon-arc could provide the necessary heat. If the rock were heated with air, (perhaps from the oxygen created from smelting as described by Tom) it would effectively "burn" which would allow the temperature to be lowered. Also this would eliminate the problem of the vaporized rock turning back into rock after exiting the blaster and cooling. This is similar to some ablative tunneling systems that use lasers to vaporize the rock.

In conclusion, I believe the atomic earth blaster is a possibility because similar machines have been patented and materials are available that would allow it to work as described. It is interesting that "Tom Swift and His Atomic Earth Blaster" is copyrighted in 1954, before the apparent development of the subterrene and it is also interesting that it contains such a detailed diagram. Perhaps the Los Alamos scientists read the book, or the idea was already being considered.

What impact would the Atomic Earth Blaster have on our lives? To answer this question, we need only look at the subterrene, which is a similar machine. The U.S. Federal government conducted two cost studies comparing the subterrene to conventional tunneling technologies. In general, the subterrene could construct tunnels more cheaply than conventional machines because of labor savings and because the molten rock

could line the tunnel. This cost advantage was particularly evident with large tunnels or where the rock conditions are very unfavorable.

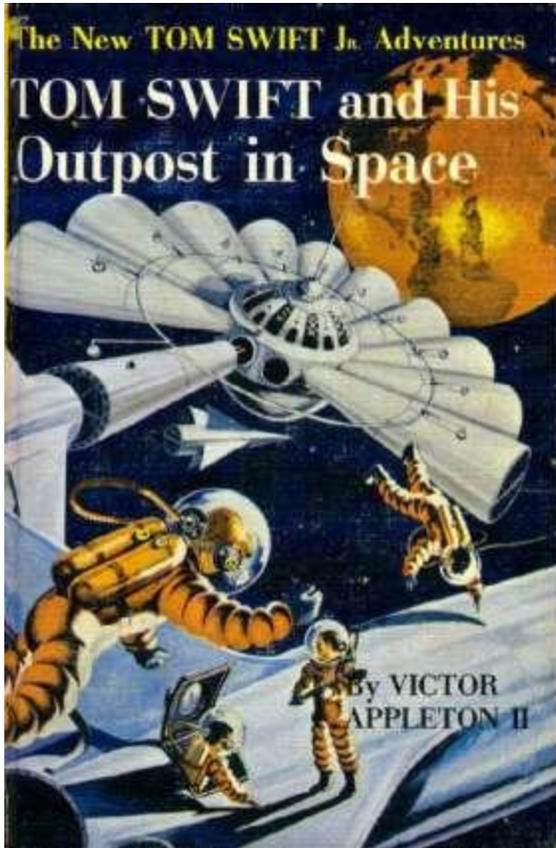
I believe that it is now unlikely that the atomic earth blaster will be commonly used because it is nuclear powered. When the book was written, atomic energy was the way of the future, but since that time the public's fear of atomic energy and the side effects of exposure to radioactivity has increased and a machine that uses a nuclear reactor is unlikely to gain widespread support. However the blaster would be very useful.

A machine that would tunnel cheaply without the need for manual operation would save lives in tunnel construction, which is often very dangerous. Also the lower costs would allow more construction of tunnels for roadways and trains, freeing up space on the surface.

An atomic earth blaster could also be used to construct tunnels and underground shelters on the moon or Mars. These could protect astronauts against the harsh conditions and cosmic rays.

The blaster could also be used for mining, but not in the way described in the book. The mantle of the earth (the layer below the crust) is now known to not be pure iron, but consists of iron and magnesium silicates, similar to a mineral called olivine. More economical grades of ore are readily available on the surface without the trouble of drilling through the earth's crust.

#6. Tom Swift and his Outpost in Space (1955)



Summary: Extracted from the dustjacket of the book:

A space station 22,300 miles above the earth is Tom Swift Jr.'s latest project!

Tom's plans for his gigantic hub-and-spoke outpost of the universe calls for twelve laboratories. Solar batteries will be produced in one laboratory, another will be a celestial observatory, and another a radio broadcasting and TV station relaying programs over one third of the earth.

But the project is beset from the start by a fiendish enemy, and also that weird phantom of outer space, Zero Gravity.

Tom comes to grips with the problem of weightlessness by inventing a Zero chamber. Here, in order to master the helpless feeling encountered in space, men are trained to develop a new set of muscular reflexes. Crewmen crawling like flies up and down the walls and across the ceiling of Zero G creates momentary comic relief.

But this is only a prelude to an exciting drama which takes place on a Pacific island, where Tom's rocket fleet is about to blast off. Strange warnings that terrify the natives nearly

wreck Tom's plans. How the young scientist overcomes all obstacles and launches his space station makes a gripping book. And each technical detail of this fascinating story has been carefully checked. For those who enjoy the thrill of adventure and the chill of mystery, *Outpost In Space* is must reading.



Major Invention #1: The Outpost in Space

There are several very important inventions in this book, and because so much detail has been given on each invention, I will deal with the inventions one at a time and will give each major invention its own complete section. Moreover, because such a wealth of information was given on each invention, I will divide up the information on each invention into several sections.

The most important invention in this book is, as you might guess, the **Outpost in Space**. The Outpost in Space is a large space station built by Tom Swift to, among other things, manufacture his solar batteries. Of course, that's not all the 50-passenger space station can do; it is also equipped with a telescope, some communications equipment, and other things.

Why It Was Built

Why did Tom Swift build his Outpost in Space? Tom Swift had several motives behind building his gigantic space station. When the book begins, Tom Swift needs a factory to manufacture his solar batteries. Since his solar batteries are energized most efficiently in outer space, Tom decided to build...

"A space factory where we can manufacture solar batteries."

Phyl gasped. "A space factory!"

"Only a small one," Tom went on. "I'll locate it in an orbit fairly close to the earth, in order to make the job of building it as simple as possible. Say, a little over a thousand miles up. From down here, you could see it racing around the earth like a tiny moon."

However, Tom later greatly expanded his Outpost in Space after the following conversation with a group of engineers:

"Tom," said his father, "Mr. William Bruce is from the Consolidated Broadcasting Network, and is chairman of this committee of engineers from the major broadcasting companies. They've come to discuss a very important problem with us."

The group took seats, then Mr. Bruce addressed the Swifts. "I'll state our problem at once. As you know, high-frequency-signal coverage in its present form is far from being efficient. Distances are short, requiring many relay stations. Sometimes there's distortion. Also, sunspots or magnetic storms may wreck the broadcast completely."

"In fact," he went on, "any reliable system of short-wave broadcasting over great distances is practically hopeless with our present methods. However, there's one solution to this problem--"..." as a scientist, you've no doubt guessed what I'm about to propose."

"A space station?" Tom burst out in his enthusiasm.

Bruce nodded. "Exactly. Our committee has come to the conclusion that it's the only way we can hope to lick our broadcasting troubles--that is, by setting up a platform in space to which we can beam radio signals and have them relayed directly back to earth. Naturally, this would be a huge project. But we feel that Swift Enterprises is well fitted to undertake the job."

...

The six visitors plied Tom with questions about the station which he answered readily. Finally Bruce nodded approvingly and remarked:

"Your plans certainly seem quite sound. From what you've told us, I'm convinced that the station you have in mind is entirely practical. But as you have already said, the station would have to be placed in a much higher orbit."

...

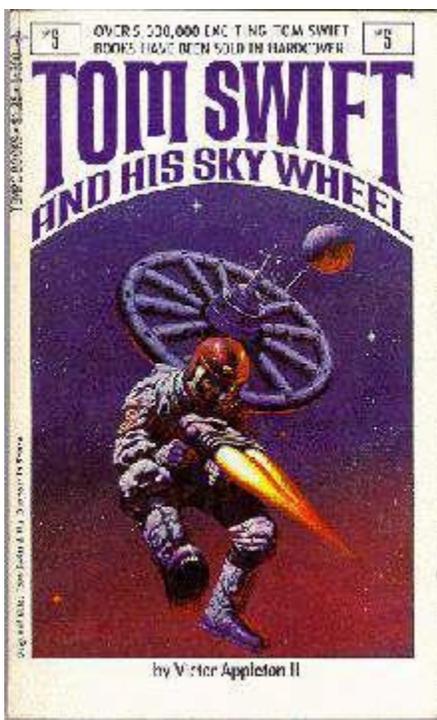
Then he remarked that it would make the job more expensive to shoot supplies by rocket to such an enormous altitude. But he admitted that from this one station alone, radio or television signals could be relayed to one third of the globe!

"A marvelous accomplishment!" Mr. Bruce said enthusiastically. "Later on, if our project is successful, more stations can be built. In this way, we could ring the earth with a foolproof broadcasting system. Think of it, gentlemen--world-wide television would become a reality! We could pick up TV images anywhere on earth and beam them back to viewers right here in America. That is," he added cautiously, "if all countries consent."

When the Swifts realized the potential military value of Tom's Outpost in Space, they decided to include the government on the project as well:

Mr. Swift remarked wryly that the project would no doubt stir up plenty of trouble from unfriendly countries. "The space station would certainly carry telescopes," he said, "and could detect every warlike move by an enemy. In fact, gentlemen," he concluded, "this will be a very big undertaking from several angles. Therefore I believe the United States Government should be included in the project."

The Problems



How did Tom Swift solve the oxygen supply problem? As one might guess, keeping the space station supplied with oxygen is a very important task. Finding a cheap, efficient way to provide oxygen, however, can be very daunting. Tom Swift Sr., however, found a good way to solve this problem, as the following conversation reveals:

"Having trouble, son?" he inquired sympathetically.

Tom nodded. "It's the air supply, Dad. I never realized until now the great amount of oxygen the crew of the space station will use up every day. The average man consumes about three pounds of air during a twenty-four-hour period. Even transporting oxygen in liquid form could mean a real supply problem."

"Perhaps it might be possible to *manufacture* your own oxygen," Mr. Swift suggested. "Or, at any rate, enough to supply part of your needs. Day, by a process of photosynthesis."

"You mean, by using green plants to give off oxygen?" Tom asked doubtfully.

"That's the idea. Of course no ordinary plants would do, but I seem to recall reading somewhere--"

The ender scientist's voice trailed off as he tugged thoughtfully at his lower lip. Suddenly he said, "I remember now! It was in the *Annual Review of Microbiology*. The writer mentioned some tiny one-celled water plants called chlorella--"

Tom snapped his fingers excitedly. "Of course! I read that, too. In strong sunshine they produce up to fifty times their own volume of oxygen per hour!"

"Correct!" Mr. Swift added. "And of course they would remove the carbon dioxide the men exhale. With a few tankfuls of such plants, I think you could supply the oxygen needs of your crew."

Tom revised his calculations in the light of this new oxygen supply. A moment later he looked up triumphantly.

"Dad, you're a wonder! I think chlorella may be the answer." Grinning, Tom added, "Why don't you come around here more often?"

As one might guess, this did the trick!

"It looks as if we have the oxygen supply problem licked, Tom. Thanks to your dad!"

"By using those chlorella algae?" Tom asked, referring to the tiny green water plants.

"Right. We've just finished running tests on the stuff. In strong sunlight, five tankfuls of those plants will absorb carbon dioxide and give off enough oxygen for a crew of fifty men!"

"Fine. How big are the tanks?"

"Five feet square and filled to a depth of one inch," replied Grady. "They're in a greenhouse on the roof."

Incidentally, the idea of "growing" your own oxygen has been around for a long, long time. It's a good solution and will eventually happen, but today it just isn't practical.

How did Tom Swift solve the water problem? Getting enough water to the crew aboard his space station is another very important but difficult task. How he solved this problem is revealed in the following conversation:

"How about the moisture problem?"

"We're working on that." Grady pointed through a glass window to several men in a sealed test chamber that was filled with a foglike haze. "According to our estimates, a man needs about two quarts of water a day. Half of it he gives off to the atmosphere by breathing and evaporation. That much we can recover, purify, and use over again."

"The rest we'll have to bring up, I suppose," said Tom.

"Right. About one quart per man."

Tom rubbed his chin thoughtfully. "Well, we can save the weight of containers by bringing it up frozen into cakes of ice."

Grady snapped his fingers. "Tom, that's an idea! As the ice melts in the space station, it'll take part of the load off the air-conditioning system, too!"

And how does Mir get its water? Well, previously I had thought that it depended on water from Earth, but Tom Ippolito pointed out to me that Mir actually has an efficient water recycling system:

Mir has a closed loop life support system. The costs of resupply from the ground are prohibitive. Water which has been transported to the cabin atmosphere through evaporation and through breathing is recovered as humidity condensate using condensing heat exchangers. Water which has been used for personal hygiene (containing a variety of substances including salts, soaps, hair and other particulate matter) is collected for purification. Urine is also collected for treatment.

Currently, these three sources form the primary inputs to life support water reclamation systems. Disinfectants are added to the reclaimed waters to prevent the growth of pathogenic microorganisms. Water contained in feces and other solid waste is lost from the system and is made up by onboard water production facilities or periodic resupply.

Three separate water purification loops are used onboard the Russian Mir space station. Urine is purified as a feed to the electrolysis cells which generate oxygen. Hygiene water is reprocessed for re-use only as hygiene water. All potable (drinking and food preparation) water aboard Mir comes from the purification of humidity condensate or from resupply. This is similar to the original water reclamation scheme for the ISSA (International Space Station Alpha).

How did Tom Swift deal with the enormous temperature fluctuations in outer space? The temperature in outer space varies very widely between day and night. Protecting the occupants (and the station!) from the intense solar radiation is a difficult problem, but Tom Swift managed to solve it:

"What about the heat from all the solar radiation out there in space? Won't that run pretty high too?"

"You're so right," Tom admitted ruefully. "I figure that the outside temperature of the space station may run close to 1,500 degrees Fahrenheit. Which means we'll need a terrific cooling system for the setup."

"And a heating system, too," Sandy put in, recalling a discussion with her father. "Dad says it gets down to 459 degrees below zero during the two hours of darkness." "Really?" Phyl was surprised. "The earth doesn't get that cold."

Tom explained that the earth and its air blanket retained the sun's heat during the night hours. "It might seem chilly," he added, "but by comparison with outer space, a zero winter's night is mighty cozy."

"What's being done to lick this heat problem?" Bud asked.

"Well, for one thing," Tom said, "The station will be built of magnesium with a highly polished, almost white surface. In that way, it will reflect the heat rays rather than absorb them. Also, the station will be coated with Tomasite for further protection. And inside, it will have a double wall of thin steel with more insulation sandwiched in between."

(So the next time you see a picture of the white International Space Station, you'll know why they *had* to paint it that color.)

How did Tom cope with the lack of gravity in outer space? When Tom Swift was building his space station nothing was known about the effect of weightlessness upon a person's health. Tom had to guess, then, what weightlessness would be like, and by and large he did a pretty good job.

To test the validity of his theories he planned to build a zero-gravity chamber, as is related in the following conversation:

"By the way, what are you doing to offset the lack of gravity up in space? Have your station spin all the time to produce artificial gravity?"

Tom replied thoughtfully, "I'm not sure that's necessary, Dad. When Bud and I took our ride around the earth 1,075 miles up we were not bothered too much by the feeling of weightlessness that comes with lack of the earth's gravity holding you down."

"But you were aloft only a little over two hours," Mr. Swift replied. "Some experts believe that human beings couldn't survive long without gravity. Their nervous systems might not be able to stand it for extended periods of time."

"Only an experiment will prove it," Tom said...

"How?"

Tom went on to say that a feeling of weightlessness was not unlike a feeling of helplessness.

"One would have to learn how to do everything a different way--eat, drink, move, work. And I see no reason why some of that can't be done right here."

"You're way ahead of me, Tom," his father admitted. "Have you cracked the impossible, son? Are you going to produce zero gravity here on earth?"

"No, Dad. But I am going to build a transparent, sealed room outdoors [indoors] about twenty feet square and fifteen feet high, which we'll call the Zero-G chamber."

"Yes. And then?"

Tom considered for a moment, drumming his fingers on the workbench. "Well, you know how a piece of metal can be floated between the poles of a rapidly pulsating magnetic field. I'll use the same principle."

"But human beings aren't made of metal."

"No, but I believe a metal suit could be designed to produce the same effect. A person floating in the air chamber would feel mighty helpless. Now if he had to find out how fast or slow he had to propel himself to try to reach, say, a hammer that was floating too, and then go after nails and wood also in the air--"

"I see," said Mr. Swift. "You'd be overcoming some of the problems you'd meet up in space."

"Exactly. I'd add this test to the others that my crew would have to pass in order to become spacemen."

The elder inventor looked impressed. "You may have something there, son. It's certainly a good idea. And if it's found that continuous lack of gravity isn't advisable in your space station, you can always start it spinning to set up artificial gravity."

"Right."

Tom's test chamber had one flaw, however: it could not test the effects of *prolonged* weightlessness upon a person. For short periods, Tom Swift is right: weightlessness does indeed have little effect upon a person. Over longer periods, however, a person's health and muscle system rapidly deteriorates. This is something that his chamber could not predict, and as a result he couldn't foresee any problems. Still, if there were any problems to weightlessness Tom planned to give gravity to the station by spinning it, as is related in the following question.

How did Tom Swift plan to set up artificial gravity on board the Outpost in Space in case artificial gravity proved to be necessary? I'll let Tom explain this one:

"We *could* make it rotate, Chow," replied Tom, "if we wanted to set up artificial gravity."

"How's that again?"

Tom attempted to explain. "You see, Chow, once we get out there in space, everything will seem weightless. We'll just float around with nowhere to fall to, because there won't *be* any up or down. But some people might not find that very pleasant. So the answer would be to start the wheel turning."

"What good would that do?" Chow asked, still mystified.

"Ever seen what happens if you twirl a ball around and around on the end of a string?"

"Why, brand my radarscope, any jughead knows that. The speed keeps the string taut with the ball being pushed out."

"Right. So if the *wheel* started spinning around, everything inside would tend to push out toward the rim. In other words, for the spacemen inside each spoke, 'up' would mean toward the wheel hub and 'down' would mean toward the rim."

Station Details

What did Tom Swift's space station look like? The book goes into some detail about the internal floor plan and external design of the space station. Here are a few passages on that subject for you:

..."This station is a very original design," he commented. "Like three spokes in a giant wheel."

"Yes," said Tom. "We could add as many spokes to the hub as we wish. Would one or two be enough for your broadcasting purposes?"

The engineers felt that they would need three for commercial broadcasting.

"And I believe the government would want one," Mr. Swift remarked.

...

"This is really what our space station will look like if we ever get it built. You see, each spoke of the wheel will actually be part of a rocket. But we won't connect them to the hub until after we shoot them out into space."

"You mean, people are going to live inside this contraption?"

"That's right. The whole thing will be hollow. And each spoke will be a separate compartment for one particular use."

"Like for instance?" Chow queried.

"Well, some will be observatories, others labs. Some will be for manufacturing our new solar batteries, and some will be used for broadcasting or telecasting. Of course the crew will be able to go from one compartment to another, either through the hub or through these connecting alleyways that form the outer rim of the wheel."

"And how would a critter go about getting inside in the first place?"

"Through one of these ports at the outer end of each spoke," Tom said, pointing to the model. "Whenever a supply rocket comes up from earth, it will nose right into an opening and unload."

...

"After outlining his plans, Tom showed them the model of his proposed outpost in space. "These two sections," he said, pointing, "will be assigned to astronomical work. Of the others, two will be used for making solar batteries, three for commercial broadcasting, one for government broadcasting, one for medical purposes, one as my private lab, one for sleeping quarters, and one for dining and recreation."

What is known about the telescope that was installed on the space station? For the same reasons that NASA launched the Hubble Space Telescope Tom Swift decided to place a telescope on his Outpost in Space:

"Now let us show you our plans for the space telescope."

He unrolled a sheaf of drawings. "As you can see, the optical elements will be held together by a mere spiderwork of wires. The heavy mirrors will be weightless out there in space, so this is all we'll need to brace them rigidly."

Compared to giant telescopes used on earth, the space telescope would be small. But Dr. Harlow explained that it would give a much clearer, sharper picture of the heavens because there would be none of the earth's atmosphere to blue out the view.

"Think how the skies will open to us!" the white-haired astronomer said enthusiastically.

That telescope, by the way, was later replaced with one of Tom Swift's fantastic Megascopes Space Probers.

What space suits did Tom Swift plan to equip his space station with? Tom well understood the extreme danger of being in the vacuum of space without a spacesuit and he designed a special spacesuit for use at his Outpost, as the following conversation reveals:

Tom checked every bit of equipment carefully. Ken Horton...was intrigued by the weird-looking suits for the crew to wear while assembling the outpost in space. Made of tightly woven-wire fabric to withstand tremendous bursting pressure, the suits were coated with synthetic rubber both inside and out to make them absolutely airtight. The helmets were metal, with tinted transparent plastic visors to see through, and contained radio sets for talking back and forth with other crewmen.

"I'll sure feel like a being from another planet in one of these." Horton laughed. "Tell me more about them."

Tom explained that each suit would be provided with its own oxygen supply and air-conditioning equipment.

"That's really necessary, isn't it?" Ken commented.

"It is, if we hope to survive any accidents out there in space," Tom replied.



"Such as?"

"Well, suppose a meteorite plowed a hole through one of the walls of the space station. All the air would rush out of that compartment, and the men who repaired the damage would have to work in a temporary vacuum. Without these space suits, they'd suffer explosive decompression."

"Yes," said Ken. "The air in their lungs would explode outward and the blood would boil in their veins! It's a horrible thought."

"That's why everything has to be figured out so carefully beforehand," Tom commented.

(The picture, by the way, is extremely flawed. If you'll read the description carefully, you'll notice that it says that "The helmets were metal, with tinted transparent plastic visors...". The picture, however, gives the figure an all-glass helmet. Obviously someone slipped up.)

How did Tom Swift plan to manage the communications and supply rockets for his Outpost in Space? Managing a space station involves a lot of ground work, as any employee of NASA will tell you. Somehow you need to coordinate rocket launches, communication link-ups, and a whole host of other minute details. To deal with these problems, Tom Swift built a large complex on a little island in the Pacific Ocean called Loonau:

"Brand my neutralator, you got a regular rocket city built up on this little ole island!" He gaped at the vast extent of the humming base, with its miles of machine shops, commissary, barracks, and recreation areas. Special docks had been built for the fuel tankers and salvage tugs. And the hangars and warehouses were crammed with supplies and part assemblies for the outpost in space.

What is known about the rockets that launched the Outpost in Space? Here is some information on the launching sequence of the rockets Tom used to ferry him and his astronauts up into space:

Amid great fanfare, part of the first section of the giant space wheel was blasted aloft in an unmanned cargo rocket. The rest of the great central hub was sent up shortly after lunch.

"Who's gonna ride herd on them contraptions?" puzzled Chow, as the second rocket streaked upward

"No one," explained Tom. "once they reach the orbit, they'll just float around up there till the space crews arrive to unload them."

...

As eight o'clock approached, Tom entered the pilot's cabin with the crew and checked the flight tape. Then he shook hands all around, adding:

"This is a big moment for all of us. You're leaving on one of the greatest voyages in human history. Good luck and we'll join you soon!"

Blast-off proceeded smoothly. Tom stayed with the radar-tracking crew, exchanging signals with the rocket until it reached the orbit safely about one o'clock that afternoon.



At eight that evening, rocket Number Two took off, with Hank Sterling in charge. It contained the crew's bunkroom section of the wheel.

Next day, two more rockets were launched on the same time schedule--one at eight A.M., the other at eight P.M. The first was the mess hall and recreation spoke of the space wheel; the other, the observatory in which the telescope would be mounted.

...

Like the other rockets designed for this project, it dropped off only two stages en route. The third stage, which was hauled clear up to the orbit, would come apart in three sections. The center would become one of the spokes of the space wheel. The nose and firing engines would be coupled together and would be used to ferry spacemen back to Loonauai whenever that became desirable.

Rocket number 12, by the way, was the last rocket to be launched.

How was Tom Swift's Outpost in Space constructed? The construction of the space station is a tedious process, even if you do have dozens of astronauts at your disposal. However, the construction of Tom's space station went rather smoothly, as the following passages reveal:

The crew spent the rest of the afternoon going over the operation of the tiny one-man rockets which they would use for their construction work in space. Motive power was supplied by swivel-mounted reaction pistols in back, fired by triggers inside the rocket.

"And remember," Bud warned them grimly, "keep these babies attached to your mother ship by a cable at all times. Otherwise you may blast yourselves off into eternity!"

...

An awesome sight met their eyes. In the starry blackness of outer space floated a great silver wheel hub, with huge holes where the twelve spokes would be connected. Ranged around it were the first four rocket ships. Swarming all about were tiny space-suited figures and midget construction rockets, tied to their mother craft by long lines. Working with cables and winches, the men were trying to maneuver the rocket ships into their hub holes.

...

The next step was to weld the spoke in place. The nose section was then unscrewed and wormed back through the hollow spoke. A crew outside in space suits then sent it off to a distance of a hundred feet to await further use as a ferry to Loonauai.

...

The great silver station was now a more imposing sight than ever. Besides the latticework telescope poking out from the astronomer's observatory, the wheel also bristled with radar scanners, and radio and TV antennae. From the factory sections, wedge-shaped lids opened up, revealing polished mirrors to catch and reflect the sun's rays in toward the solar-battery assembly line.

Where were the rockets launched that launched the parts of Tom's Outpost in Space into orbit?

"Have you decided where your rockets for it will be launched?" Phyl asked Tom.

"Dad's negotiating for a site on a Pacific island near the equator," Tom replied. "The launching area has to be somewhere in mid-ocean, so that the first two stages of each rocket can be dropped off safely after they're burned out."

...

"It's a tiny spot called Loonauai--hardly a speck on the map. We've just received clearance."

Did Tom Swift design any special equipment to be used in the construction of his Outpost in Space? Yes, he did. Tom Swift designed his own version of an EVA unit, as this passage reveals:

He now showed Ken the midget one-man rockets that he had designed for the project. Each one had a pair of jointed, robotlike arms, controlled from inside, for handling tools or

manipulating objects in space. The crewmen would "fly" around in these midget rockets while constructing the outpost or doing any outside work."

What orbit did Tom's space station occupy? Interestingly, the orbit of Tom Swift's space station coincides with the geostationary orbit of many current radio satellites:

"Twenty-two thousand miles would be better for broadcasting purposes," Mr. Swift spoke up. "And the station should be in a path directly above the earth's equator, I suppose."

"Yes," said Mr. Bruce. "At that altitude the space station would revolve in its orbit once every twenty-four hours--exactly in time with the earth's rotation. And above the equator it would remain fixed above the same geographical spot at all times, which is what we would need."

...

Sketching in the sand with a sea shell, Tom went on to describe how the rockets would take off straight upward, then gradually tilt to an easterly course. After climbing to a height of 22,300 miles, they would finally level off.

"After that they will travel in one orbit, keeping opposite the same spot on earth at all times."

"You mean the space station will stay in that location?" Phyl asked.

"Yes."

"Good night!" said Sandy. "Won't it have to travel horribly fast to do that?"

"A little over 6,800 miles per hour." Tom grinned. "Which works out to about 1.9 miles per second."

Phyl shivered. "Golly, it makes me dizzy just to think of it!"

Chuckling, Tom added, "All of us are whirling through space pretty fast right now. In fact, a person at the equator is traveling at a speed of almost a thousand miles per hour. We're doing a little less."

...

"I believe a point directly above Loonauai will be the best spot for our space station."

How much did Tom Swift's Outpost in Space cost? A great deal, as can be imagined. The exact figure was never mentioned, but after looking at the price tag for the International Space Station and realizing

that Tom's was several factors larger, one can guess that the final price tag was probably between \$50 and \$100 billion dollars. Financing it proved difficult even for Tom, but between the network companies, the government, and Swift enterprise, he managed to scrape enough money together to build it. (It should be noted, however, that the "several other" space stations the book talked about were never built; evidently one was all that he could afford!)

The Possibility and Impact

How feasible is it to build an Outpost in Space? This is one question that has answered itself! Since this book was published there have been a number of space stations: there has been the Skylabs, Mir, and others. Come 2002, in fact, the construction of another space station (the International Space Station) will be completed. So, obviously, it is possible to build a space station.

Building a space station the size of Tom's, however, is a problem. While the size of Tom's station was never mentioned anywhere in the book, it is obviously far larger than any space station we've ever built. Replicating Tom's space station is, however, quite possible, and only poses a large number of technical difficulties.

The problem with creating a space station that is that large is in the price: who is going to pay for it? Tom had it easy: he was able to split the cost between the wealthy Swift Enterprises, a large network company, and the US Government. Demand for such a station back then was high, especially since satellites had not come into existence yet.

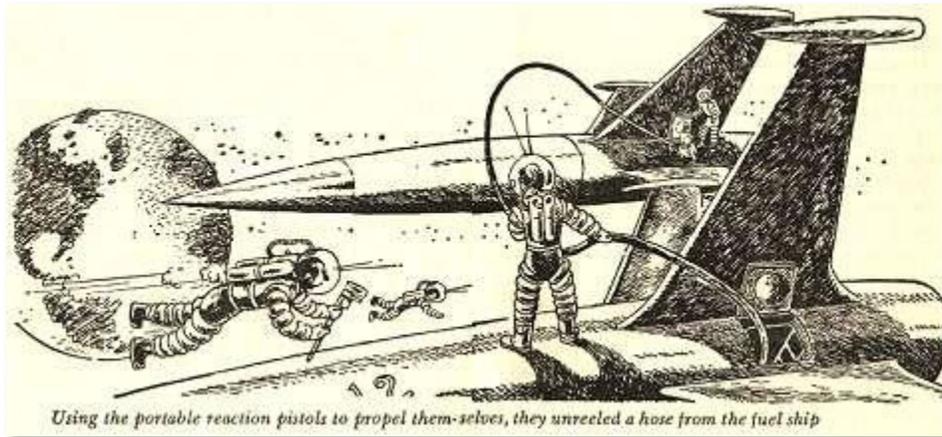
Over the years, however, the demand for a space station has decreased, largely because of the debut of satellites. Anything that a space station could have done, a satellite can do much cheaper and more efficiently.

That's not to say, however, that Tom's space station will never be built. Should we ever decide to colonize other planets in a major way, we'll have to build a large space station to construct rockets in-orbit.

How much impact would the Outpost in Space have on civilization? As I said in the previous question, any demand that Tom's space station would have had has been realized by the debut of satellites. Satellites, as we all know, allowed extraordinary things to happen: among other things, we can monitor the weather (and enemy countries), we can call people on the other side of the globe, we can watch TV world-wide, and we can use the Global Positioning System to pinpoint the location of objects and people. The world has been dramatically changed by satellites; were we to remove every satellite from orbit we would find the world to be a strange place indeed.

Tom's space station, however, did have many advantages that satellites do not. For example: a space station can be used to conduct in-orbit and zero-gravity experiments; it can be used to grow high-quality products that can only be produced in microgravity; it can be used as a base to construct rockets in-orbit; and it can be used as a stopping place on voyages to, say, Mars.

The exact value of a space station will be determined soon. NASA is scheduled to begin the construction of the International Space Station soon. Once it is completed sometime in 2002, we will at last start realizing the value of a permanent space station.



Major Invention #2: The Solar Batteries

Another important invention in this book is Tom's amazing **Solar Batteries**. The solar batteries are just what they sound like: normal, ordinary devices that store electricity. The "solar" part comes from the fact that they get their electrical charge from a one-time exposure to the sun's rays.

So what's so amazing about a new kind of battery? Simply the amount of electricity they can store. Think of a solar battery as being the ultimate in batteries: one small, featherweight battery can hold enough electricity to power a car for the life of a car, and a larger group of batteries could be used to power an ocean liner for the life of the liner. They're simply incredible. Add to this the fact that they receive their charge from the sun, and you have a pollution-free, nearly-infinite source of energy.

How did Tom's Solar Batteries work? As one might guess, the book didn't say a word about how the solar batteries worked. All we know is that they get their electrical charge from a brief exposure to high-intensity sunlight. Somehow, that brief exposure to sunlight causes a violent change in the electrical states of the battery -- so much so that, if that charge is held, it can take years to return to a normal, uncharged state.

What problems did Tom Swift have to overcome in creating his Solar Batteries? The first problem Tom Swift had in creating his solar battery was in getting the battery to store electricity efficiently:

Soon the altimeter needle was approaching the 85,000-foot mark again...Tom's new solar battery had been mounted in an aperture in the dome for exposure to the rays of the sun. At high altitudes the rays were more powerful than in the denser air blanket surrounding the earth. Wires from the battery were connected to a voltmeter and other electrical instruments.

When the young inventor returned to the flight deck, his face wore a disappointed frown.

"Anything wrong?" Bud inquired.

"The voltmeter reading is way down," muttered Tom thoughtfully, running his fingers through his blond crew cut.

"What does it mean?"

"That the battery's efficiency for storing electricity will have to be improved. In other words, the battery will take a charge but won't hold it properly. I'll have to try some other method.

To fix this problem, Tom Swift spent some time in his laboratory redesigning the metal in his battery until he had it just the way he wanted it. The redesign, by the way, worked great; in fact, Tom said that the metal worked out better than he had hoped for.

Another problem Tom Swift had to deal with was in getting the battery to retain its charge rather than releasing its charge all at once:

A split second later came a blinding flash of light from the rocket!...

"What in the name of aerodynamics was that?" he gasped.

Tom grinned wryly and said, "Crazy as it may sound, that flash of light proved our experiment is a big success."

"How so?"

"Come here. I'll show you." Tom led the way to the burned-out rocket and pointed to the now-blackened porthole. "Notice what's happened to the metal frame around the quartz window?" he remarked.

"Wow!" Bud exclaimed. "It's fused solid to the metal shell of the rocket. The heat from that flash must have been terrific."

"Right," Tom agreed. "Which means our battery picked up a sizable charge out there in space."

"Then this foil you developed is going to work!" Bud responded enthusiastically.

"Well, the sol-alloy *did* become energized by the solar radiation," Tom explained. "In other words, a big percentage of its free electrons was energized to highly excited states and trapped there on the surface of the metal foil. But the trouble is that they didn't *stay* trapped."

"You mean the battery short-circuited somehow?"

Tom nodded. "That's what caused the flash. Apparently the sol-alloy is very unstable when it's in a charged state. So now the stuff is to figure out a desensitizer for the stuff--something to keep it from discharging all of a sudden as it did just now."

...

"It oxidized completely when that flash occurred," Tom muttered.

"Cheer up, pal," Bud said, clapping him on the back. "Just be glad you didn't oxidize along with it."

Tom smiled, then became serious. "If a commercial battery ever failed that way," he said, "no buyer would touch another with a ten-foot pole. It could ruin our whole market overnight."

...and how was that problem overcome? Read on:

"Hey, what happened to the color of our sol-alloy?" he asked with a puzzled look. "It's darker than it was."

"That's because of the desensitizer I've mixed with it, so that the stuff won't pop off like a flash bulb the second it gets down to our atmosphere," Tom replied.

The young inventor explained that he had used as a desensitizing agent a trace amount of a transitional metal sulfide. He had incorporated it in the sol-alloy when it was smelted. "And now we'll put together a four-cell battery," he said.

"What happens if the old sol-alloy oxidizes again?" Bud asked.

"It'll blow the rocket to smithereens..."

How was Tom Swift's Solar Battery manufactured? The book doesn't tell us how the solar batteries were assembled. However, it does describe how Tom built the first one:

Bud watched with intense curiosity as his friend smelted small quantities of several metals together in a small electric furnace... Finally he felt he had the right combination. The alloy had a high degree of malleability.

"Now we'll put this through the rollers," he told Bud, leading the way to a workshop full of heavy equipment. Tom pushed a wall button, setting a series of highly polished steel rollers into action. Into them he fed the hot metal, which finally was reduced to a thin sheet.

"Your mother couldn't have done better with a rolling pin," Bud quipped, as Tom trimmed and cut the foil in a shearing machine.

...

Tom rolled up four sheets of the sol-alloy and inserted them into cylindrical cells made of a plastic he had invented which he called catalium. Then he filled the cells with a liquid ammonia under pressure. As each cell was fitted, Tom sealed it off. Finally, when all the cells were ready, he assembled them in a battery case made of catalium.

How heavy were Tom's solar batteries? From what I can tell, Tom's batteries were extremely light:

He handed it to Bud who gave it a surprised whistle.

"This is so light a child could lift it easily. Man, wait until the automobile makers get wind of this!"

Tom chuckled. "Bud, if that one battery you're holding works out, it'll supply enough power to run a whole fleet of cars!"

How much energy could one of Tom's Solar Batteries hold? The book doesn't give any exact information on the size of the battery, so it's hard to say exactly. However, the book does give an exact voltage number per battery cell:

"Hang on to your space hats!" cried the young inventor with a broad smile... "Each cell tests better than two hundred volts and it will be easy to make batteries with a line voltage of a thousand or more."

How did Tom Swift test the efficiency of his Solar Battery? Tom Swift had a simple yet efficient way of testing his batteries:

Tom spent the rest of the afternoon rigging up a special test chamber. Inside it, the battery would be connected to a heavily overloaded circuit and at the same time undergo extreme conditions of temperature, pressure, and electrical stress.

"What's all this supposed to prove?" Bud queried.

"It'll show how well the desensitizer can do its job," Tom explained. "Twelve hours in this chamber will drain the battery as much as six months of normal use would. If that voltage needle points anywhere near as high tomorrow as it does right now, we'll know we've got something!"

And, of course, Tom's battery passed the test:

At breakfast the next morning, the two boys hurried to the laboratory. By this time, the battery had undergone almost fifteen hours of testing. Tom removed it from the chamber and quickly hooked up the leads for another reading. To his delight, the voltage had dropped only a minute fraction of one percent!

Tom was jubilant. "Bud, this means the battery has a terrific efficiency! It should last for years--and you've seen how lightweight it is. It's just what we need for powering all the equipment our outpost in space!"

What uses did Tom speculate his Solar Battery might have? For most of his inventions Tom did not foresee very many potential markets. This invention, however, is one exception, as the following conversation proves:

"Tom, if this new invention of yours is half as useful as your preliminary report indicated, it should find quite a market."

"You be the judge, Uncle Ned," Tom said, brimming with confidence. "A battery one-tenth the size of this will provide enough energy to run an automobile for the life of the car. On the other hand, we can easily make one big enough to power an ocean liner."

"Incredible!" Mr. Newton said, as Tom continued:

"But that's not all. These solar batteries will find particular application wherever the weight factor is all-important, as in aircraft and rocketry. And how about pocket-sized arc welders and dentists' drills?"

"What about the cost?" Uncle Ned interjected.

"They'll be high-priced to start with," Tom admitted. "But in terms of long life, they may well turn out to be the cheapest form of power known."

How feasible is it to build a Solar Battery? Well, it depends. I think that, with a little trouble, it would be possible to build a battery that received its electrical charge from sunlight. In fact, I think that you are currently able to buy a battery recharger that recharges batteries via a large solar cell.

However, building a lightweight battery that could hold such a charge "for years" under heavy use is clearly out of the question, even if you aren't concerned with making it lightweight. After all, consider: automobile

makers would *love* to have a battery that could power a car for 200 miles between charges. Clearly, making a battery that can power a car for 250,000 miles between charges is ridiculous!

How much impact would a Solar Battery have on civilization? A solar battery would undoubtedly have an enormous impact on civilization. Everyone would want one: airlines would want them to power their airplanes, car manufacturers would want them to power their cars; engineers would want them to power machines. Indeed, the world would undergo a revolution in the way it powers its objects. Power plants might be a thing of the past, for why bother to have a central producer of electricity if each object can power itself for as long as it lasts?

Major Invention #3: The Zero-G Chamber

The last major invention in this book is the **Zero-G Chamber**. Tom needed a way to both test the effects of weightlessness upon a person and to train his astronauts how to work in microgravity. To accomplish this, he built a special chamber that simulated microgravity by the use of magnets.



How did the Zero-G Chamber work? The principle behind the Zero-G chamber is this: magnets can levitate objects. What Tom did was use very powerful computer-controlled magnetic fields to simulate the effect of Zero-G:

"Tom," Phyl asked, as she stared wide-eyed through the transparent plastic walls, "do you expect to overcome the law of gravity in there?"

"No. But I hope to imitate the helpless feeling one would have if he were weightless," Tom explained. "My body won't be weightless, although it will appear to be when I'm inside the chamber in a special suit made for the experiment. The buoyancy of my suit in the pulsating magnetic field will exactly compensate for the weight of my body."

How was Tom Swift's suit designed? The suit that Tom used in the Zero-G chamber had to be specially designed. As Tom Swift Sr. pointed out, people are not naturally metallic and therefore are not naturally repelled by a magnetic field.

"Where's this suit that you're going to wear, Tom? Mother and I want to be sure it fits right."

Tom winked. "It's the latest fashion on Mars," he said. "If you'll excuse me, I'll go put it on."

Tom returned in a few minutes. His appearance drew a loud buzz of interest. From head to foot, he was clothed in a weird, tight-fitting metal suit resembling fish scales. Slits had been left for his eyes, ears, and nose.

The suit had been tailored especially for Tom and was made like a bulletproof jacket. It was composed of a myriad of tiny soft iron disks, sewn together on a fabric backing. The disks were built up like the flesh on his frame, clustering most heavily on the thickest parts of his body, whereas the gloves encasing his hands were fairly thin.

"Well, brand my lariat, a walking hardware store!" Chow exclaimed. "How can you ever move around in that there suit o' armor?"

"Feels a bit heavy, all right." Tom chuckled. "But I'm expecting the Zero-G chamber to change all that."

Did Tom Swift expect his crew to be able to adjust to no gravity? Yes, he did:

"Do you think a space crew will be able to adjust all right to zero gravity?" Horton asked eagerly.

"I'm sure of it, Ken," Tom replied. "But we'll all need careful training to develop a new set of reflexes for weightlessness."

How feasible is it to build a Zero-G Chamber? Technically, building a magnetic zero-g chamber is ridiculous. The technical problems alone are enormous, and when you add to that the constant computer coordinating that must be done to keep the effects of weightlessness, you are left with a problem of major proportions.

However, there are other ways to simulate microgravity. Ever notice that, when you fall, you appear to be weightless? Well, NASA got a bright idea: what it does is it takes a specially built 747, fills it with some astronauts, flies it up to 40,000 feet, and then sends it on a controlled "fall" toward the ground. During that fall, the conditions inside the plane exactly match the conditions in microgravity: people can float, for example, and water will not pour.

Another way that NASA uses is to drop an astronaut (spacesuit and all) into a swimming pool and weigh him down until he is neutrally buoyant. When he is neutrally buoyant microgravity is again simulated: he can seem to "float", and he can (among other things) work upside down.

Update 5/3/2002: I received in the mail some time ago the following tidbit from a fellow by the name of Paul. Sounds like Tom wasn't the only person with the idea for the Zero-G chamber!

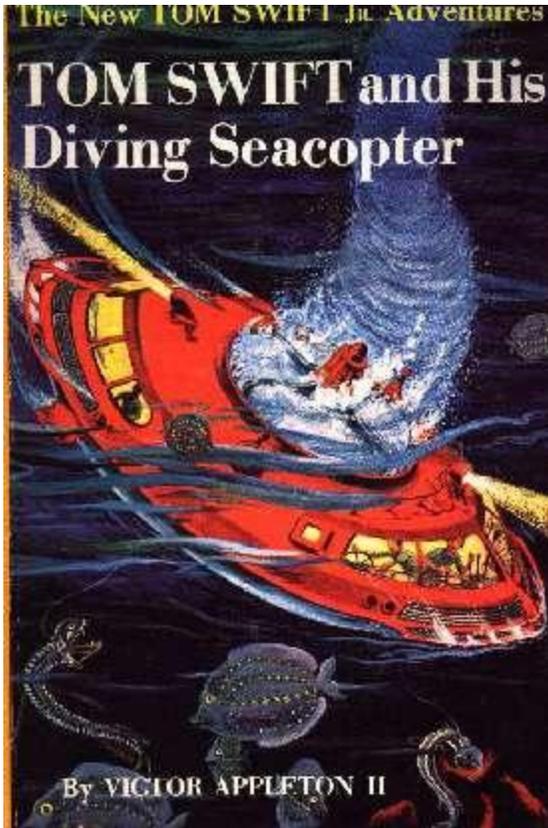
I do not know if you have ever seen the science fiction movie "gog" (1954). You can get it from www.filmwizards.com.

At one point there is a "zero gravity" chamber that uses magnetism to simulate null gravity for space flight training. Two people wear metallic clothes and demonstrate for the investigator.

This seems very similar to the zero gravity chamber in TS Jr. #6.

Very interesting!! I wonder if there was a previous mention of such an idea that both drew from or if this movie was the inspiration for the idea?

#7. Tom Swift and his Diving Seacopter (1956)



Summary: Extracted from the dustjacket of the book:

In his unique invention the *Ocean Arrow*, an "underwater helicopter," Tom Swift Jr. embarks on a precarious search for a lost rocket from space.

The rocket, containing evidence of living things on another planet, was directed to Swift Enterprises for scientific study. But its course was mysteriously changed while the rocket was hurtling toward earth--and its landing site is unknown!

Tom suspects that the rocket lies underwater, somewhere off the coast of South America. Accompanied by his friends, Bud Barclay and Chow Winkler, and two expert oceanographers, the young inventor sets out in his diving seacopter to locate the rocket.

But a group of unethical scientists have uncovered a clue to this valuable treasure from space. In their own undersea craft, they try to thwart Tom in his attempt to claim the rocket which rightfully belongs to Swift Enterprises.

Unexpected dangers confront the Swift expedition every mile of the seraph for the scientific prize. When the *Ocean Arrow* is trapped in a crushing, underwater landslide, Tom and his companions nearly lose their lives. How they overcome subocean hazards, as well as their cunning enemies, makes one of the most exciting stories to date in the TOM SWIFT JR. series.

Major Inventions

(The summary below was written by Graeme Woods. Thanks again for volunteering!)

The most important invention in this book is the **diving seacopter**. This is how Tom introduces his latest invention to Bud:

"You mean an underwater airplane?"

"No. A flying submarine."

"Cut the kidding," Bud retorted.

"It's the truth," Tom continued. "It'll even crawl around if necessary on tractor treads."

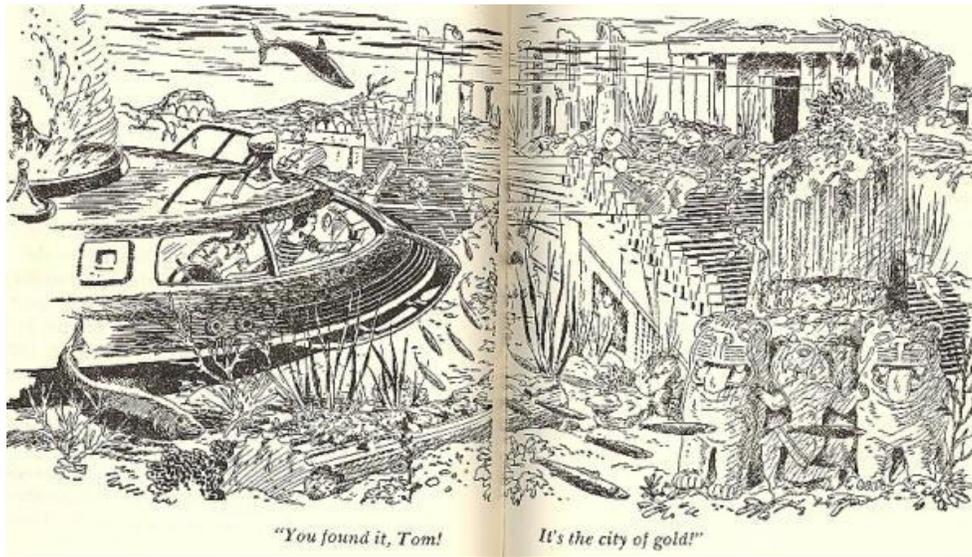
"No fooling! What do you call it?"

"A diving seacopter."

Another minor invention that is mentioned in passing is the **Eye-Spy camera**. This is how Tom describes it:

"Takes motion pictures and records sounds through walls or solid objects," Tom replied. "Five seconds later it projects the result on the screen and player. Actually it's an improvement on Dad's old television detector."

The book does not detail the Eye-Spy camera's principles of operation, and I can't guess how it would work.



How does the Diving Seacopter work? The seacopter is essentially a nuclear powered saucer shaped underwater helicopter that can also fly in the air. It comprises a central rotor section with variable pitch blades that provide lift in the air. The pitch of the blades is reversed for submerging and the blades turn slower due to the higher density of water compared to air. The nuclear reactors also power jets that provide steering.

This is how Tom explains the benefits of this approach:

"The big advantage of this kind of submersion," Tom continued, "is that these blades eliminate the need for ballast tanks. With the rotors, the seacopter can easily stay at any level beneath the surface the navigator chooses, merely by adjusting the blade pitch."



The seacopter can surface without power, as it is naturally buoyant. It also has tractor treads for crawling around the bottom of the ocean.

The diving seacopter is nuclear powered as explained by Tom:

"Each compartment has a miniature atomic reactor which manufactures the superheated steam," Tom explained. "This steam is then released out the jet pipes underneath the compartment. When the seacopter is all assembled, steam for the jets will be channeled from the excess used to drive the rotor blades."

I would expect that when the seacopter is flying, the atomic reactors are used to superheat air to power the steering jets and the rotor, similar to the Sky Queen.

The book explains the layout of the seacopter as follows:

He noticed that the seacopter was divided into three sections: a cabin at either end, called Compartments A and B - each of which would accommodate 3 people - and the center section containing the rotor

blades. This section was open top and bottom to allow the water in. It had narrow corridors on either side of it for passengers to walk from one compartment to the other.

Compartments A and B (later dubbed **Subro** and **Airmo**) can separate and operate independently if required and Tom is forced to separate the units when Subro is damaged in an underwater landslide.

When this happened, I was surprised that the Airmo nuclear reactor did not continue to provide power, since each section is independent. Presumably the reactor must have been damaged in the accident. Although the solar battery was damaged by water, preventing the use of the radio, Tom was able to use the tractor treads to ride up on the beach. Where did the power for this come from?

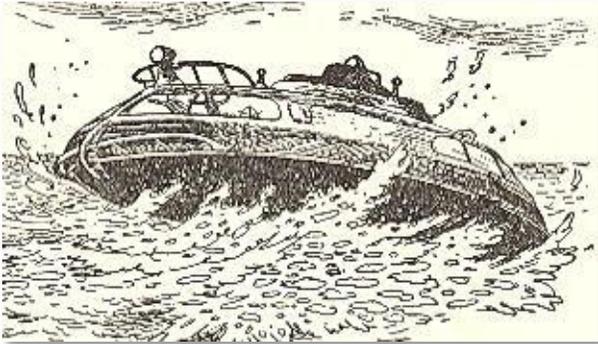
Would the Diving Seacopter work? I believe that the seacopter could work. The saucer shape is particularly interesting as this allows motion in any direction through both air and water. The seacopter is very similar to Cousteau's Diving Saucer (although the Diving Saucer is tiny compared to the 40 foot seacopter) as this craft also has positive buoyancy and uses jet propulsion.

However, I think that there would be some significant practical issues to overcome.

Firstly, the atomic reactors would need to be light enough to allow the seacopter to fly, even after providing heavy shielding to protect the crew against radiation. When Tom designed the Flying Lab, he

used Tomasite to shield against radiation without adding excessive weight, so I imagine he has used this material in the seacopter.

Also, the seacopter could not release any radioactive materials into the environment and would need to operate in corrosive seawater. This means that it could not run water or air directly through the core of the reactor, but would need a heat exchanger to transfer the heat from the reactor to water or air. This tends to add weight.



Experiments into using atomic power for aircraft were conducted in the 1950's and early 1960's but were abandoned after enormous technical problems and safety issues. I believe that it is very unlikely that we will see fission-powered aircraft of any description in the near future because of the greater public awareness of the dangers of exposure to radioactivity.

Secondly, the rotor unit and blades would need to work properly in both air and water (water is approximately 800 times denser than air). I think that this would present a significant design challenge. Tom has difficulties with the rotor design, but this is corrected by developing a new alloy and changing the design of the blades.

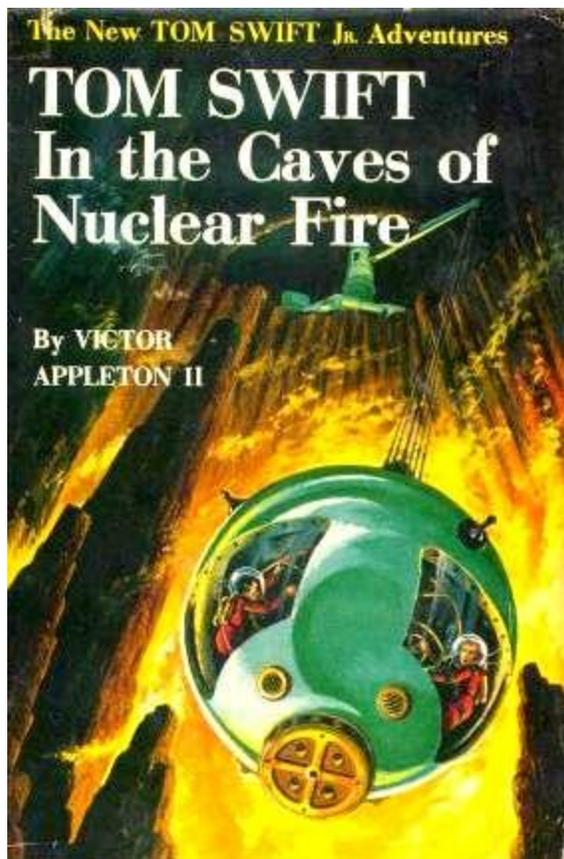
What impact would the Diving Seacopter have on our lives? I think that the concept of a flying submarine would be useful to two major groups; the military and scientists. A craft that could operate in both air and water would be a powerful weapon for the world's navies. It would also help oceanographers explore under the ocean as a seacopter could travel under its own power to the exploration site without the need for support vessels and resultant delays.

The positive buoyancy would add to safety. If there was a problem, the seacopter would simply float to the surface.

Outside of these specialized applications, I think that the nuclear technologies in the seacopter (light weight shielding, miniature reactors and heat exchangers) would be enormously beneficial if feasible (and the problem of radioactivity could be overcome).

If nuclear powered aircraft were safe, flight duration would no longer be limited by available fuel. Fuel costs are a significant cost in running any aircraft. However, as mentioned above, I think that the safety issues are insurmountable - no-one wants the risk of nuclear materials being spread a reactor rupturing in an aircraft crash or being exposed to radiation during flight.

#8. Tom Swift in the Caves of Nuclear Fire (1956)



Summary: Extracted from the dust jacket of the book:

"Tom, that strange gas is fantastic--disintegrates everything it touches! What do you think it is?"

Fascinated by the amazing report from a pilot who crash-landed in the African jungle, Tom Swift Jr.'s eyes glow with curiosity as he replies: "Sounds like antiprotons rampaging. Such a phenomenon is unknown on earth. This may be the greatest discovery of the century. It could revolutionize the whole science of atomic energy. Let's investigate that taboo mountain."

Although several of the young inventor's associates view his latest expedition with skepticism, Tom sets off in the Flying Lab for the Dark Continent to fathom the secret of the mysterious mountain. The deadly vapors which have terrified the natives for generations challenge even the scientific genius of Tom and his companions.

When their atomic drill inexplicably is sucked into a forbidding peak. A series of startling events threaten the Swift expedition. How Tom, with his new invention the Terrasphere, conquers a heretofore unknown, violent quirk of nature brings this breath-taking story to a spectacular finish.

Major Inventions

(The following summary was written by Ardith Hoyt. Thanks for volunteering!)

The first invention in this book is the **Terrasphere**. It seems to be very strong, resistant to almost anything, and prone to problems with the cables. The book gives a good description of it:

The craftsman was referring to Tom's new invention, a vehicle specially designed for the exploration of cave systems and areas of very rough terrain. It was a low-slung, streamlined tank eighteen feet long, powered by nuclear-activated steam turbines. These would drive a set of caterpillar treads.

The driver's cabin was located in the rear and a hoisting crane rested along the top, nearly the length of the roof. The unique feature of the invention was its main cabin which nestled on the forepart of the chassis.

Spherical-shaped, with two wide windows, the cabin was removable. When the crane was in operation, cables hanging from it were attached to the cabin to swing it away from the chassis, and raise or lower it. Occupants of the cabin could safely explore and study deep chasms or caves which other vehicles could not penetrate.

The cables mentioned above broke twice. The first time, they all broke at once, when Tom was testing the machine. The second time, half of them broke down in the cave, putting three people in danger. I bet Tom spent a while perfecting the cables before he let the Terrasphere be mass-produced! The vehicle was also resistant to radiation and fire (a fact which both Bud and Tom forgot at different times), even the gas from the caves, once it had its coat of Inertite.

Which brings us to the next invention, **Inertite**. It took Tom a while to find the proper substance to keep his jars from disappearing when the gas from the cave hit them. First he tried some ordinary materials, and a previous invention or two:

"They're containers I had made up to get samples of that African gas," Tom explained. "According to Craig, it disintegrated his crockery and metal bottles, but I'm hoping one of these more refractory capsules will hold the gas."

He picked up a sheaf of papers from the workbench and handed them to Bud.

"These are the 'specs' on each of the containers - what material was used to make them and how. Read them off to me, please, and I'll stamp the symbols on each one."

"Right," Bud began reading: "Heavy glass, lead, asbestalon-- That plastic asbestos of yours ought to do it." He went on reading, "Tomasite - Pal, I'd bet on that one any day." Bud knew that this plastic, transparent paint, which Tom had invented, was heat-resistant and radiation-proof, and a three-inch thickness of it would protect the engine of an atomic power plant!

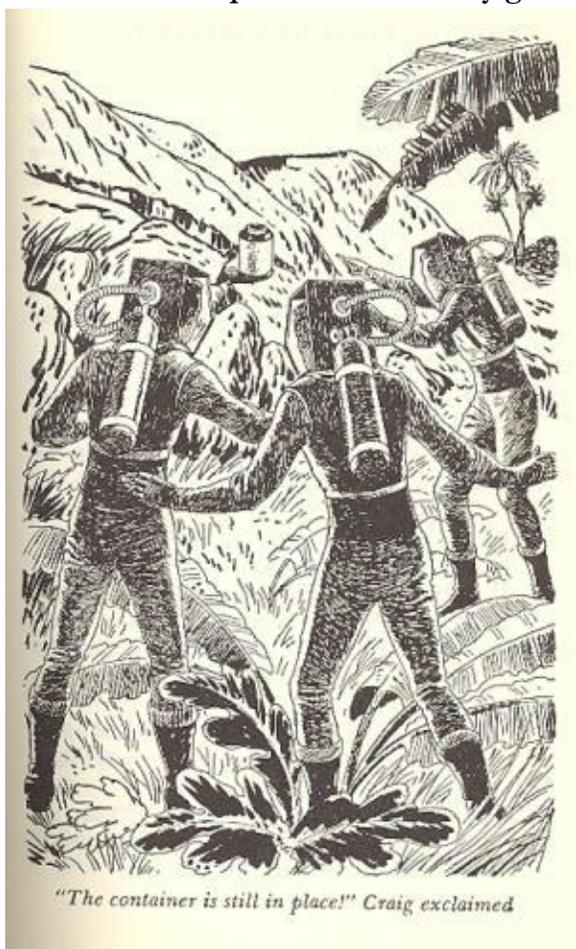
None of these different materials worked. Instead, they all disintegrated when they came in contact with the gas. He then realized that the rock the cave was made of was not disappearing. He took some samples and started to work on them, with a little trouble at the start:

Then next morning Tom resumed work. For him the day passed quickly, as he tried experiment after experiment. Again when night came, there was another intrusion by Bud and Craig.

"You two are like a couple of mother hens," Tom remarked, laughing. "But I suppose I owe you an explanation. Since crushing the rock, I've been trying to concoct a paint for covering containers. So far, I've had no success."

"Do you think you'll solve it?" Craig asked.

"I will!" Tom declared. "next, I'm going to try a paint using a gelatin base. To the gelatin I'll add a portion of the finely ground rock. The combination will be a colloid. With luck, it might work!"



Apparently, it did. The bottles painted with this stuff didn't disappear like the others. They named it Inertite, and promptly painted the Terrasphere with it. Now Tom was finally able to collect his gas samples.

This gas was eventually called Exploron. Here's an excerpt describing the experiment:

Hanson and Sterling helped him to construct a special box-shaped chamber for this experiment. After the walls of the chamber had been heavily coated with Inertite, electronic measuring devices were attached to recesses built into the top of the chamber.

Tom carefully placed one of the containers inside the chamber and by remote control released a small quantity of the gas into the enclosure. The results of the initial test revealed some startling facts. The gas proved to give off antiprotons, as Tom had suspected, but he was amazed to learn that it had an atomic weight of 286. This value was unknown to the atomic table!

"...the properties of this gas are different from anything yet know to science," Tom told his friends. "It may turn out to be the greatest discovery of our age!"

Everyone was excited, but also awed and a little worried. "That stuff is pretty dangerous!" commented Hanson. "Will it ever have any practical uses?"

"It's only a matter of learning how to harness the gas," Tom declared. "Already I see the possibility of using it to form completely new isotopes."

The antiprotons mentioned were described earlier in the book:

"First of all," said Craig, "what's antiproton matter?"

"To explain that," said Mr. Swift, "you'd need a basic idea of how atoms are constructed."

"I took some science in school," Craig replied. "I know that the popular concept of an atom is that it looks like a miniature solar system. In the center is a nucleus. Moving around it are particles called electrons. The whole thing is similar to our own planets moving around the sun."

"That's basically it." Mr. Swift nodded. "An electron has a negative charge. A proton is the positive charge of the nucleus. Then we have the neutron, which is the uncharged constituent of an atomic nucleus."

"That much I understand," said Craig.

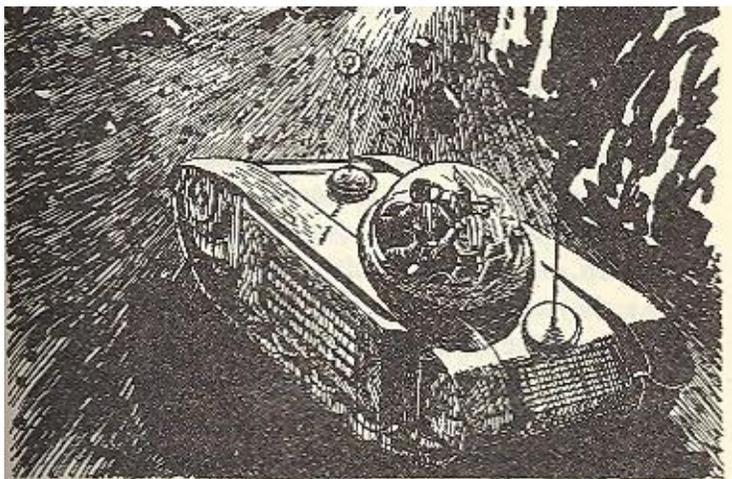
"Now in antiproton matter," Tom took up the story, "the atoms have the same 'solar system' setup you mentioned, but there's one difference. The charges on the particles are reversed. What was the electron is now a positron and what was the proton is now an antiproton."

"I suppose," Craig said, "there's a completely different reaction if they come into contact with foreign substances."

"Definitely!" Mr. Swift broke in. "If enough antiproton matter reacted with substances here on earth, the heat produced could start a chain reaction. The world could blow itself into oblivion!"

"Wow!" exclaimed Craig. "That stuff wouldn't be anything to play with!"

"No," Tom agreed, "but it actually could be put to good use."



The cavern walls were glowing phosphorescently

This gas came originally from the caves, which were amazing in themselves.

The walls glowed in the dark:

"Wow!" exclaimed Bud. "What a sight!"

The cavern walls were glowing phosphorescently. Every bit of rock surface seemed to be aflame with a cold, green-white light.

"Remarkable!" said Craig, "but it's sure eerie. What do you think is causing the cave to glow, Tom?"

"It must be a secondary reaction of the gas," the young scientist theorized. "The atomic structure of the rock is being excited. That would produce such an emission."

Then there was the pit, reached by digging through the wall at the end of the cave:

Tom continued to drill until he had made an opening large enough for him to crawl through, then the blaster was withdrawn. Immediately a red glow could be seen in the opening.

Tom, his heart pounding excitedly, crawled through. He caught his breath at the sight.

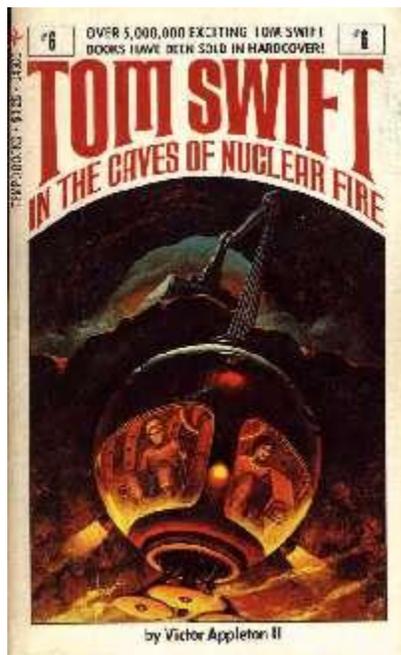
Below was a deep pit whose red, green, and yellow phosphorescently glowing walls formed a sheer drop of over five hundred feet!

"A cave of nuclear fire!" Tom exclaimed.

Below he could hear a rushing river which he was sure no man had ever explored. He looked far down into the pit - he could hardly wait to descend into it at low tide with the sphere.

Apparently the river, which ends at the sea, goes up and down a little with the tide. This causes water to dash against the side higher up, against "uranium ore and a nuclear catalyst. The protons produced from the water trigger a nuclear fusion of the uranium with other atoms in the mineral bed to produce Exploron."

So, how practical are these things? The Terrasphere seems reasonable, perhaps without its own nuclear power plant. In fact, vehicles like this may have already been made. Inertite, Exploron, and the caves are another story.



First of all, the only way to make antimatter on Earth is with a giant particle accelerator, and then only a few particles at a time, which soon meet with ordinary matter and are annihilated. Any large source of antimatter would destroy itself, since there is no way to protect it from ordinary matter, which is what this world is made of. If there was that much antimatter produced in the caves, the caves would disintegrate, blowing up a large portion of the surrounding area. Antimatter colliding with ordinary matter makes a LOT of energy.

Also, uranium is not likely to fuse with anything. It just has too big of a nucleus. We haven't even been able to produce controlled fusion with nuclei of two or three particles, and that takes temperatures of a hundred million degrees. Even stars can't fuse elements as heavy as uranium.

Even if such a thing could happen, it would produce far, far more energy, as would any antimatter produced.

Yet another problem is that I don't think any element, even one as heavy as this Exploron could decay to produce antimatter. They are just two

completely different things.

There was also another little invention, the **extinguisher capsules**. Here's an excerpt:

Tom reached into a hidden recess of his belt. From it he withdrew a handful of capsules and handed several of them to his companions.

"What are these?" asked Dilling.

"Extinguisher capsules," replied Bud. "Tom invented them."

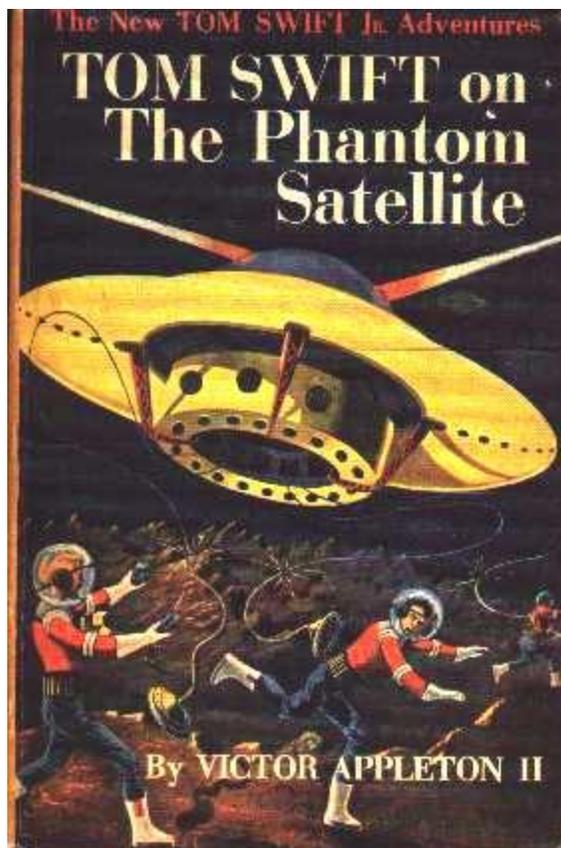
"Start throwing the capsules into the fire," Tom ordered. "Spread them around."

As the tiny extinguishers landed in the flames, each exploded in a thick, white cloud of smoke. Miraculously the fierce flames began to vanish. Soon they had all been quenched.

"These capsules are remarkable," said Dilling, as the trio started back to the car, carrying the dummy with them.

These little extinguishers would be pretty nice to have around. Think of the ease with which firefighters could fight fires! Unfortunately the book doesn't really say how they were made, and what they were made with. It does seem a little improbable, though, since it would be hard to fit something that potent into such a small space.

#9. Tom Swift on the Phantom Satellite (1956)



Summary: Extracted from one the dust jacket of the book:

Consternation and panic grip the world as a strange new moon shoots earthward. Millions of people are relieved when the weird, glowing runaway moon in the sky finally goes into orbit 50,000 miles from earth.

Tom Swift Jr., who has developed a machine that will produce artificial earth-type gravity in the airless void of space, makes plans to explore this new satellite. In the gigantic, atomic spaceship Titan, Tom and his associates land on the mysterious moonlet and claim the bleak but fabulously rich possession for the United States.

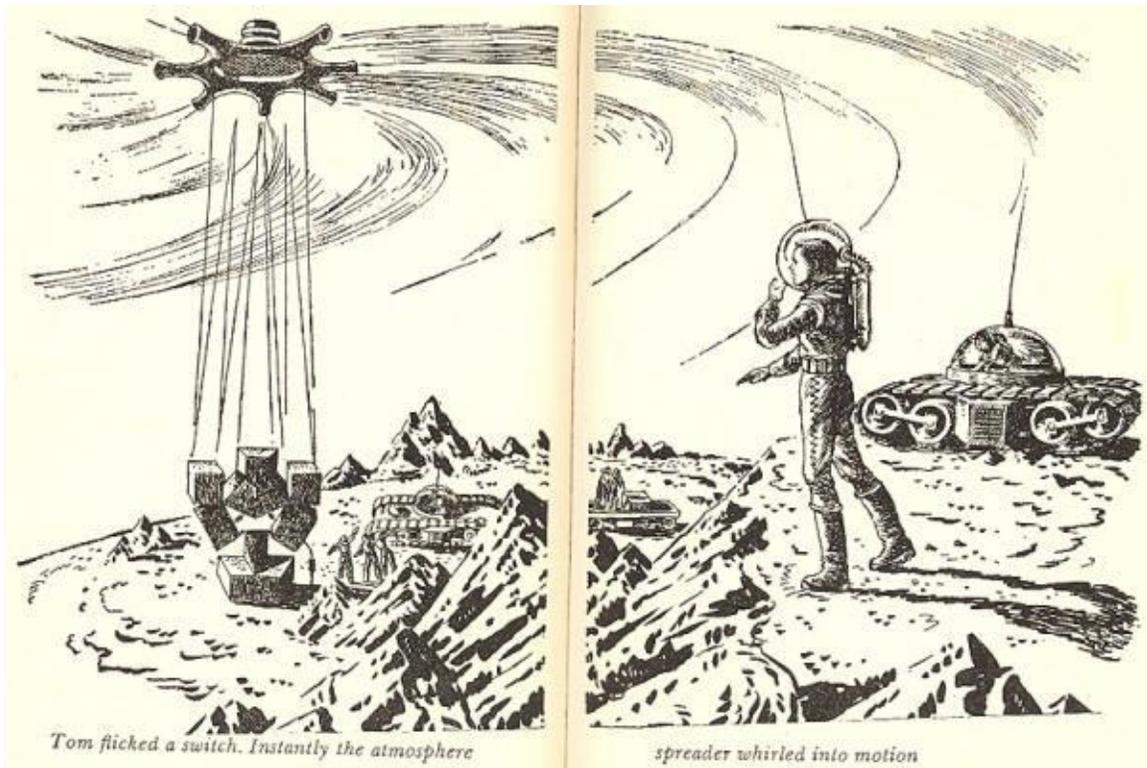
While exploring the satellite to pinpoint the best location for setting up the young inventor's atmosphere-making machine, Swift expedition scouts discover a spaceship belonging to a hostile nation. Claiming first right to the moon because of prior landing, the foreign scientists try every means to annihilate Tom and his group.

How Tom succeeds in proving the Brungarian claim invalid, and saves his associates from being set adrift in outer space, will keep the reader spellbound to the very last page of this spine-tingling adventure.

The Mistake On The Cover



If you look closely at the picture to the left (which is nothing more than a blow-up of a certain section of the cover), you'll see Tom Swift Jr. holding two rocks in his hands. The rocks, it seems, are frying the cords that belong to the suction cup devices. This does indeed happen in the book, and there is nothing unusual about it until you remember that Tom only found one strange rock -- not two -- and also had only one rock -- not two -- in his hand when this episode occurred. Why they made such an obvious mistake is beyond me, but they did! (To see for yourself, read page 156 and 159 of *Tom Swift on the Phantom Satellite*.)



Major Inventions

I could be wrong, but after looking through the book in order to write up this page I could only find one invention. The invention was pretty mind-blowing, though, so perhaps that makes up for things.

This mind-blowing invention is called, simply, the **Atmosphere-Making Machine**. The atmosphere-making machine is one of Tom's most outstanding inventions. Tom puts it to good use on the phantom satellite, too -- equipped with *only one*, he managed to set up a breathable, livable, viable atmosphere -- complete with rain and plant life -- on a dead asteroid.

How the Atmosphere-Making Machine works: The author deals with this invention a couple times. First, here is how Tom claimed the machine worked:

"Now what in tarnation would that be?" Chow asked, staring at an object on Tom's workbench. "It looks like one o' them merry-go-round lawn sprinklers--or a silver spider, mebbe."

Tom laughed. "It's a model of an atmosphere-making machine, Chow."

"You mean, a contraption fer makin' air?" A frown wrinkled the cook's forehead. "But brand my spurs, why bother makin' air? Ain't we got plenty to breathe already?"

"Here on earth we do. But on the moon and some [some?] planets, space travelers won't find any, so they'll have to make their own."

"Well, brand my ox-eegen mask!"

"Speaking of oxygen," Tom said with a grin, "my machine will not only shoot out a mixture of oxygen and nitrogen--it will also make the stuff cling together, so that it can't drift away when there's not enough gravity to hold it in place."

Chow scowled at Tom suspiciously. "An' just how do you make gases stick together? Add a little glue mebbe?"

Tom chuckled. "By using Inertite." This was a special paint that Tom had concocted from rocks taken from the Caves of Nuclear Fire in Africa. "You see, when Inertite is exposed to radioactivity, it generates a field of high-energy waves. And the waves, in turn, make the molecules of gas attract one another."

Chow's face creased into a cheerful grin. "I don't savvy a word of it, son, but if you say so, I reckon it must be true!"

"Same here!" Bud groaned. "It's way over my head!"

"It'll be way over all our heads," said Tom, pointing to a blueprint of his machine. "The 'spider' will be suspended about five hundred feet in the air."

Bud looked mystified. "But what holds it up?"

"Radib--that's short for Radioactivated Directional Ionic Beam. The pressure of this stream of charged particles supports the machine just like a Ping-Pong ball on a waterspout. And of course the beam also irradiates the Inertite."

Where does the machine get its fuel? Well...

Everyone ate a meal of compressed rations, then piled out of the tanks and went to work. As Tom worked with the crew erecting the atomic reactor, Bud supervised the men who were installing the radib generator, powered by one of Tom's solar batteries. The atmosphere spreader was then lifted on the ionic beam, and the gas feed line was hooked up to the bank of compressed oxygen tanks.

"All set, skipper," Bud reported.

"Fast work, fellows!" Tom congratulated the crew.

Bud grinned. "What else did you expect with Whiz Barclay bossing the job?"

"Watch it, boy! You'll break an arm patting yourself on the back!" Tom chuckled.

He checked various connections, then flicked a switch and opened the gas valve. Instantly the atmosphere spreader whirled into motion, becoming a silvery blur.

"How soon can we take off our space suits?" one of the workers wanted to know.

Tom replied, "First we must get the reactors working to produce enough gas to blanket the satellite. If all goes well, we'll be breathing the stuff by tomorrow and we'll notice a difference before dark tonight."

Everyone now turned to finishing the atomic reactor, except Kent, who went scouting for a good supply of iron oxide ore. This would be used in the atomic furnace to produce oxygen for the atmosphere-making machine.

The young metallurgist returned shortly with several reddish chunks. "There's an adequate supply up there, Tom," he reported.

Bud, who was standing by, frowned dubiously. He glanced up the rocky slope where Kent had found the ore, then back to Tom. "But how do we get the stuff down here to the pile--bucket brigade or wheelbarrow?"

"You're getting tired, Whiz. Better take it easy." Tom patted his pal's arm sympathetically. He grinned and added, "Just watch."

Taking a small charge of explosive from one of the tanks, Tom headed up the slope, scouted around a bit, then planted the charge at a strategic point. After clearing the area, he touched off the blast.

Boom! A geyser of dirt and rocks sprayed upward, to shower down in all directions. A miniature landslide followed this as tons of the reddish rock came pelting down the slope.

"Hey, I *heard* that, skipper!" Bud yelled in amazement. This was the first "natural" sound he had noticed since arriving on Little Luna.

Tom nodded happily. "We're building up enough atmosphere to carry sound waves," he replied excitedly. "And here's all the rock we need, just waiting to be shoveled into the reactor."

Within two hours, the reactor was finishing and a chain stoker was rigged up to feed in the rocks. Tom started the small atomic reactor. As the current was generated, it electrolyzed the iron oxide and oxygen began to boil off.

By this time, the tanks of compressed gas were exhausted. Tom spun a valve, permitting the gas feed line to draw oxygen from the reactor. In a matter of seconds, the little satellite was well on its way to producing its own atmosphere.

"Another outstanding achievement, Tom!" Dr. Jatczak said enthusiastically.

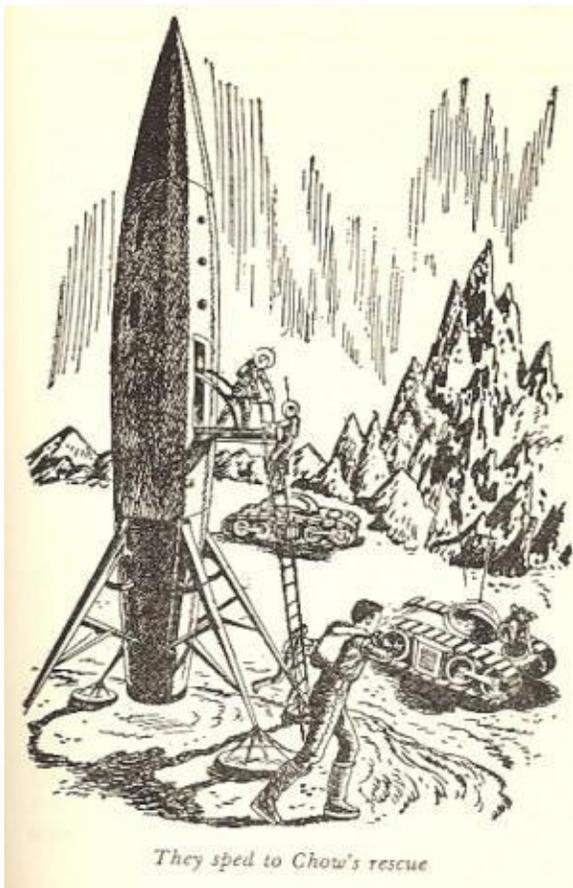
How does the machine turn the rocks into gases? Tom gives one line of explanation on this one. That line is:

Shortly before the evening meal, Kent came into Tom's laboratory with several reddish chunks of rock, flecked with metallic glints.

"Tom, I think this ore may be our best bet for producing oxygen in the atomic furnaces!" he announced excitedly.

"I'll look at it under the spectrograph," the young inventor said. He took the rock samples into the metallurgy laboratory. A few minutes later both scientists were grinning happily.

"Nice going, Kent," Tom congratulated him. "It's almost pure red iron oxide, plus about two percent of rare metals. It should vaporize very nicely in the atomic furnace."



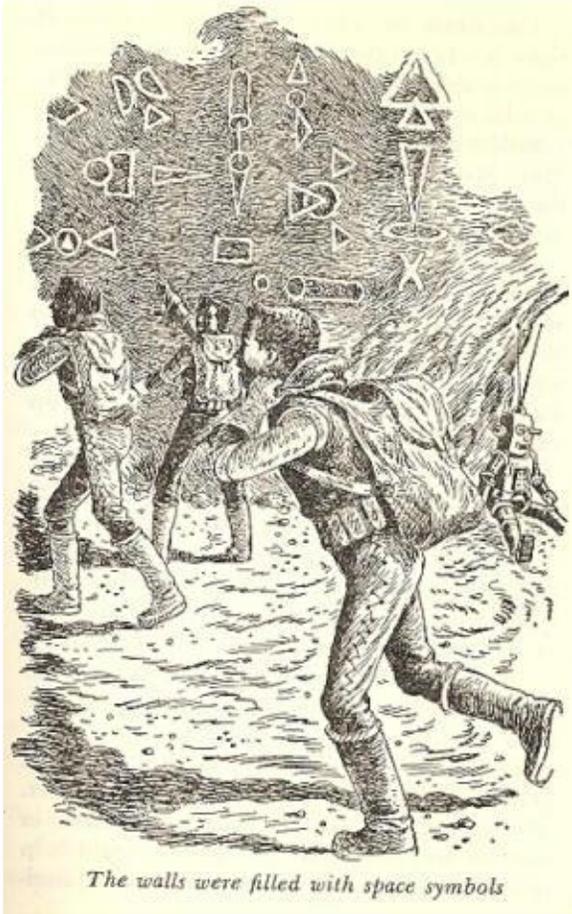
How feasible is it to build an Atmosphere-Making machine? This is kind of a tricky question. In theory it could be done. Huge plants, modeled after the Atmosphere-Making machine, could be set up on planets and used to turn rocks into ozone (to heat up the planet) or oxygen (to breathe) or something else. The process of terraformation would take a very, very long time, but it could be done.

Tom's Atmosphere-Making machine is a few steps beyond basic terraformation, though. Its size makes the invention even more unbelievable (see p.140-141 for a picture). How could a machine that tiny turn even a small asteroid into a livable habitat in only 24 hours? The only solution would be an extremely efficient atomic smelter, and even then I don't see how it could be put to such extraordinary use.

And that brings up another point. Wouldn't Tom's machine eat up an awful lot of rocks? Extracting oxygen from rocks is not an exceptionally high-yield process, and when you have a smelter as small as Tom did the process of rock smelting could take a while unless you had a really fast process. Maybe there are ways of doing this; I'm not saying it can't be done. All I'm saying is that it would be very, very hard.

The really far-out process, though, is that Inertite coating that Tom did so that the atmosphere wouldn't drift away. It's true that the atmosphere drifting away would cause problems, but how does coating the molecules with Inertite help? This question, obviously, can't be answered, since the isotope Inertite does not exist on Earth.

It is probably possible to build a machine that can manufacture a breathable atmosphere from rocks. However, doing it Tom's way -- and with Tom's size of a machine -- would prove to be a very hefty challenge. (For another look at a terraformation machine, see the Dig Allen book Journey to Jupiter.)



The walls were filled with space symbols

How much impact would an Atmosphere-Making Machine have on civilization? The answer to this question rests on some particulars concerning the machine that aren't discussed in the book. How much gas can the machine produce per day? What kinds of rocks are needed? What temperature does the machine need to operate?

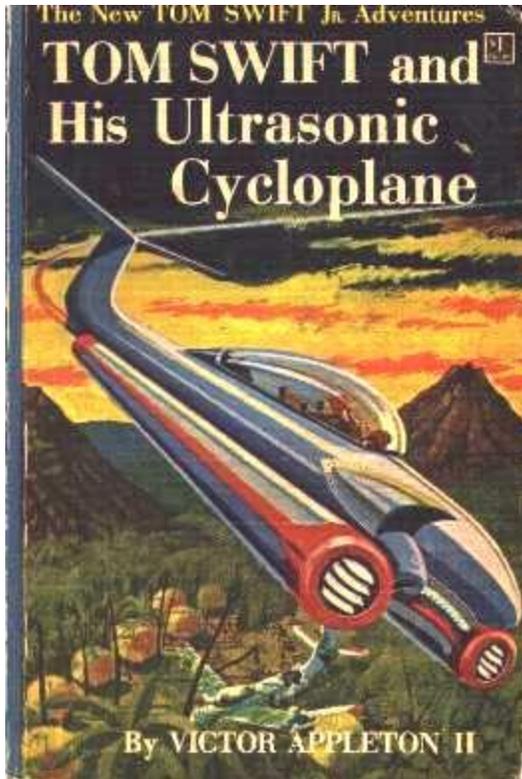
Judging from the actions of the machine in the book, though, I get the feeling that it could be very useful indeed. Think about it. Wouldn't it be nice if you could set up a couple dozen of these machines on the Moon and in the course of a month have a livable, breathable, viable atmosphere? Future space explorers could bring a few dozen of these machines on all flights and wherever they choose to land they could just scatter a couple Atmosphere-Making machines over the planet and after a month or two have an earth-type atmosphere to move about it.

The chances are extremely good, however, that the process would be far more complex than it looks. How would the machine interfere with local weather patterns? How would the machine gauge the amount of gases that already exist in the atmosphere and alter its output to create the habitat that was called for? This wasn't a

problem for Tom Swift because the phantom satellite didn't have any atmosphere and thus didn't have any weather patterns or atmospheric gases, but it could prove to be a problem on Mars or Venus.

Still, I believe that if the machine existed, these problems could be overcome, and the machine would prove to be a great boon to space travelers everywhere.

#10. Tom Swift and his Ultrasonic Cycloplane (1957)



Summary: The following summary was copied from the dustjacket of the book and sent to me by Greg Weir. Thanks, Greg!

"There's part of Bud's wrecked plane!" Hovering his new cycloplane, the DRUMHAWK, in turbulent skies above the wilds of the New Guinea jungle, Tom Swift Jr. points to the sheared-off wing of his friend's plane. The area, flanked by two extinct volcanoes, is as forbidding as the deserted native huts clustered in sinister shadows.

Without Tom's latest aircraft, which uses ultrasonic rotating drums to provide lift, a rescue attempt would be impossible. Battling violent weather conditions, the young inventor lands the DRUMHAWK and organizes a rescue expedition.

Hazards are encountered from hostile natives who fire barrage after barrage of razor-sharp stone missiles and from a scientist with a deadly ray weapon. Tormented constantly by crafty enemies and nature's perils in the search of Bud, the rescuers unearth a clue that the young pilot is a prisoner of an unscrupulous group of white men who have discovered a

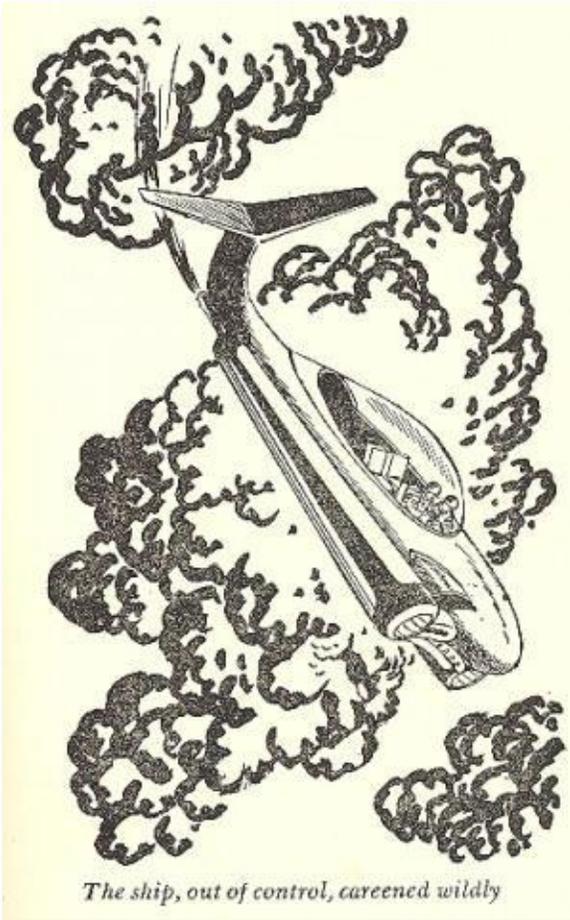
fabulous ancient secret and are utilizing it for nefarious purposes.

How Tom, at the risk of his own life, outwits Bud's captors and opens up a new field for science makes tense, exciting reading.

Major Inventions

The main invention in this book is, of course, the **Ultrasonic Cycloplane**. The *Cycloplane* is Tom Swift Jr's first redesign of the old-fashioned airplane. Using a completely new flight technique, the *Cycloplane* can take off vertically, hover, is noiseless, and can break the sound barrier. In this book, Tom Swift uses the *Cycloplane* in the jungles of Papua New Guinea to locate his friends who have crashed deep in the hostile jungles.

How does the Ultrasonic Cycloplane work? I think that Tom explained this invention well, so I'll let him handle it:



The ship, out of control, careened wildly

On each side of the ship a shiny magnesium cylinder, wide as an oil drum, ran the full length of the fuselage. In flight, the twin cylinders would spin at terrific speed, powered by Tom's ultrasonic generator that had now passed all tests successfully.

"Do you really think those twin rollers will provide enough life for take-off and flight?" Bud inquired doubtfully.

"They will if my answers to certain aerodynamic equations are correct. For example, when you apply Bernoulli's equation--"

"Give it to me in kindergarten talk," Bud pleaded. "Those ten-syllable words make my head spin. And I'm not even air-borne yet!"

"Okay." Tom chuckled. "Know how a pitcher throws a curve?"

"Sure -- by making the ball spin."

"Right. And as the ball spins, it drags air around it by surface friction. As a result, air piles up on one side of the ball and thins out on the other side."

Bud's face brightened as he suddenly caught on. "Oh sure. That air build-up on one side causes an increase in pressure, and that's what forces the ball away from a straight-line path. Only I still don't see what all that's got to do with the twin cylinders on your cycloplane."

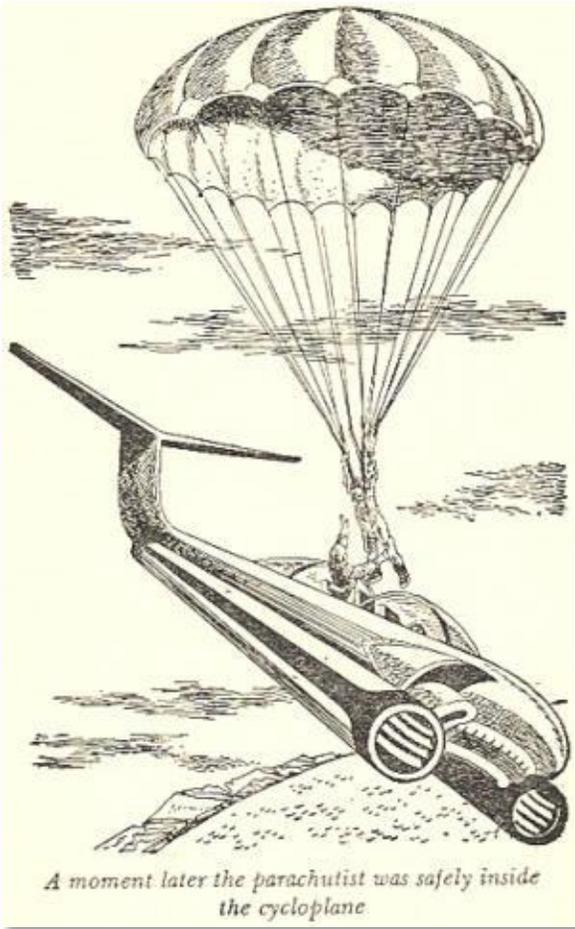
"Same principle. A stream of air from the sonic turbine flows outward from the plane and passes over the cylinder. As the cylinders spin around, the air piles up on the lower surface. So you get an increase in pressure there, just like the pressure on the lower surface of a wing. And that's what boosts us upstairs!"

"Guess it figures at that." Bud nodded slowly. "Will your cycloplane be able to do the same kind of flying as a helicopter -- I mean, hovering and all?"

"Sure, but it'll also have many advantages over an ordinary helicopter," Tom pointed out. "For example, there are no overhead rotors to cope with, and there is no noise or vibration. With the ultrasonic generator powered by Swift solar-charged batteries, the plane will fly almost forever without new fuel. And with a jet engine added for forward flight, I'm hoping to break the sound barrier."

"Looks as if you 'd picked the wrong name, skipper," Bud remarked. "You should have called it a *cyclocopter*, meaning a mixture of helicopter and cyclone!"

What other features does the Ultrasonic Cycloplane have? There are two other important features of the *Cycloplane* that I think are worth mentioning. The first one is it's an advanced automatic pilot:



"What's that box you're installing, skipper? Some kind of electronic gear?"

"It's a cybertron, Bud," the young inventor replied. "You've heard of cybernetics, the science of thinking machines? Well, this is a *cybertron*."

Bud looked baffled. "You mean that gadget does the thinking for the plane? Oh, I get it! Must be some kind of automatic pilot!"

"Right," said Tom. "A very advanced type of automatic pilot."

As Bud climbed up into the cockpit beside him, the young inventor explained how the cybertron, and gyrostabilizer, controlled by servomechanisms, would regulate the speed, course, and altitude of the cycloplane in flight. In addition, it would also beam out a radar-type signal to detect any obstacles in the plane's path.

"If an echo bounces back," Tom went on, "the cybertron automatically figures out what has to be done, and instantly alters the plane's course to avoid a crash."

"Wow! Wait'll the airlines get hold of that!"

"They'll have it soon, I hope," Tom replied with quiet pride. "That is, if it works out okay in my new cycloplane."

Secondly, the *Cycloplane* is outfitted with a pair of wheels and can be driven as a car on the highway.

What was Tom's biggest problem in perfecting the Ultrasonic Cycloplane? Tom's biggest problem with perfecting this invention was in perfecting the ultrasonic generators. Tom had two problems here: first, the generators did not work right and caused nearby items to burst into flames. Secondly, the generators caused the *Cycloplane* to vibrate, and the vibration was violent enough at speeds of 450 knots to

cause the *Cycloplane* to go out of control. Tom overcame both of these problems, however, with subsequent redesigns of the main ultrasonic generator.

How feasible is it to build an Ultrasonic Cycloplane? Well, while there are no problems in the theoretical design of the craft, there are some problems in actually carrying the plan out. First of all, there is the ultrasonic generator. The generator that Tom built emitted very intense, high-frequency waves. Creating sound waves takes a *lot* of electrical energy, and harnessing them as Tom did is *extremely* difficult as well.

Besides the major problem of creating the sonic generator there is another problem as well: system integration. You see, Tom Swift's *Cycloplane* had three separate systems: the ultrasonic generators, the jet engine, and the motor that drove the wheels. Integrating those three systems all in one small vehicle would prove to be an extremely difficult challenge -- and add that challenge to the challenge of creating the generators and you end up with a project that is feasible but unpractical.

How much impact would an Ultrasonic Cycloplane have on civilization? I think that the biggest deciding factor on the *Cycloplane's* impact is its price. If the *Cycloplane* was comparable in price to a Cessna, I think that the *Cycloplane* would likely completely take over the small aircraft market. After all, think about it: why buy a Cessna when you can get a *Cycloplane* that is faster, smoother, safer, and has an automatic pilot? Add the fact that the *Cycloplane* comes with a lifetime's supply of gas, and you have an unbeatable combination.

Minor Inventions

There are a few other interesting things mentioned in the book that I would like to mention, the first one being Tom Swift's **resistorizer**. The resistorizer is basically a one-man force-field that shields against one thing: strong electromagnetic waves. Why bother to build such a device? Well, in the book, Tom Swift discovered that the camp in which Bud had crashed was being protected by a strong electromagnetic "force shield". This force-field, in fact, is what caused Bud to crash in the first place: when Bud's plane came into contact with the field, the field disrupted the controls of the plane and caused it to go out of control.

Since Tom wanted to rescue Bud, he needed to find a way to protect both himself and his plane from the harmful effects of this shield, and he did so, after spending some long hours in the Flying Lab. Here is how he did it:

"Well, it all goes back to Maxwell's equations," Tom began. If we assume the wave length of the electromagnetic radiation produced by the -- "

"Wwoo-o-oo! Hold it, pardner!" Chow protested. "I kin bust a bronc, but I sure can't stick in the saddle when you start spoutin' them jawbreakers!"

"Okay, Chow," Tom laughed. "What it all boils down to is this: I've doped out a small gadget--you might call it a *resistorizer*, I guess--powered by one of my flashlight-size solar-charged batteries."

"What's it do?" asked one of the men.

"Very roughly, it automatically throws out a counterwave of its own," Tom explained. "This wave is always 180 degrees out of phase with any electromagnetic wave and will dissipate the energy of our enemy-s weapon in a burst of tremendous heat."

(One small side note here: some of you might have noticed that the repelatron and the resistorizer work on what appear to be the same principles. This is the case, but there is even more similarity between the two: the book *Tom Swift and His Deep-Sea Hydrodome* states that the repelatron was simply an enhanced resistorizer.)

Tom Swift soon found another use for his device, however: absorbing the force of the enemy' stunray guns. In the book, Tom Swift's enemies had a gun that produced high-intensity electromagnetic waves. The waves, when they hit a person, had the effect of stunning him. Tom Swift's resistorizer acted as a defense against the electromagnetic waves by dissipating the waves in a burst of intense heat.

While we're talking about the enemy's stunray guns...

What did the enemy's stunray guns look like?

His other arm cradled a queer-looking device like nothing Tom had ever seen before. Cylindrical in shape, it was covered with white ceramic insulation. From the front end protruded two thick electrodes that looked like the antennae of some monstrous insect.

How did the stunray guns work?

An instant after the unknown man pulled the trigger a bluish-white luminescent glow filled the air around the electrodes. For a few fearful seconds Tom wondered if his resistorizers would repel the attack.

Feeling no effect himself, he watched his friends. They too seemed to be all right.

Ed, relaxing a bit, said, "Tom, how does that thing work?"

"The antennae probably sends out a train of electromagnetic shock waves!" Tom replied...

Meanwhile, the bluish-white luminescent glow still filled the air around the antennae of the overseer's weapon. But fortunately it had no effect on Tom's group. Even Bud and Hank showed no evidence of further shock.

Suddenly there came a sound like a small thunderclap. A wave of heat struck them with the searing force of a furnace blast! Fearfully Tom and his companions fell back, shielding their faces against the overpowering heat.

"Wow!" choked Ed, struggling for breath. "Wh-wh-what was that?"

"Our resistorizers dissipating the shock waves!" Tom explained.

All three of the rescuers were red-faced and panting. Their lungs seemed to be on fire from the stifling effect of the hot air, but the resistorizers had protected them from being shocked into submission.

How strong was the stunray gun?

"Sure is a deadly looking gadget." Ed Longstreet shuddered. "Especially when the business end was pointing our way! Could it kill a man?"

"Not likely," Tom replied. "I imagine the field is just strong enough to knock a person out at close range. What I'd like to know is how the thing's powered, but I guess that will have to wait till I have time to take it apart."

How was the stunray gun powered?

"How about that electric shock gun, skipper? Do you think Strang used [the natural battery] in there?"

"I believe not," Tom replied. "But let's find out for sure."

With deft fingers he took the weapon apart, then burst into laughter. "Strang tried to knock me out with one of my own inventions! This shock gun is powered by a Swift solar-charged battery he must have bought!"

Also, about the enemy's main electromagnetic wave oscillator...

Where was the oscillator located? The oscillator was located in the same cave as was the ancient city.

How did the oscillator work? The book doesn't give any details, but I imagine that there was nothing very complex or fascinating about its innards. Simply put, it just generated electromagnetic waves.

How was the oscillator powered?

"An oscillator needs an electrical power input to make it run. But there's nothing like that down here."

Tom grinned. "Now you're asking the pay-off question, chum. See that corona around the pit? That's your answer, I believe."

He opened jackknife and reached down into the pit. A mere touch of the blade sent up a shower of sparks! Cautiously the young scientist gouged a small particle out of the ground.

"This is something like mica," said Tom. "You know -- the flaky substance that's used in making electrical insulation and condensers."

For the first time, his companions realized that the pit was actually a mineral bed of some kind. The soil was streaked and veined with queer materials, some of which Tom had just dug up on the point of his knife blade. He rubbed the stuff between his fingers, and it flaked away at the touch.

"Do you realize what this mineral bed really is?" Tom asked.

"Sure -- a mineral bed." Bud grinned.

"That's not all. It's also a huge, natural battery!"

"*What!*"

The others started at the young inventor in amazement, then Bud pleaded, "Explain it real simple like, so the rest of us can understand."

"Sure, that'll be easy." Tom smiled. "Notice how this bed is made up of thousands of layers of mica with layers of that steellike material between?"

"That steellike material is cerium, another one of the rare earths. Cerium is what they use in photocells. It makes electricity out of the daylight that pours down through the volcano shaft, and stores it up in the form of chemical energy like a giant battery. I imagine that in olden times, when the storm clouds weren't around here all the time, the charge was even stronger."

Tom's companions were awe-struck by the unique phenomenon. Doc pointed to the cables leading from the control board down into the pit. "Then Strang simply taped this source of power to run his oscillator!"

"Right," Tom agreed. "What's even more amazing is that the ancient people who lived here took advantage of this phenomenon and used it for light. I think they drilled this crevice to bring in the sunlight."

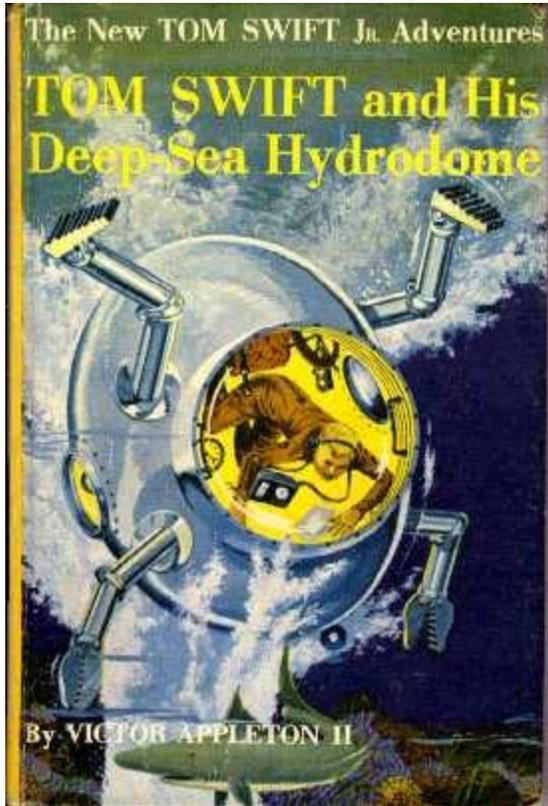
Ed gaped. "You're implying that this civilization achieved a highly advanced level of scientific know-how thousands of years ago!"

"I admit that it's only a theory, Ed, but why else would they build their city underground? There must be some connection between that fact and this natural battery--otherwise it's too big a coincidence to swallow!"

And Finally...

The book after *Tom Swift and his Ultrasonic Cycloplane* is, of course, *Tom Swift and his Deep-Sea Hydrodome*. However, if you happen to have a dustjacket copy of this book, you will find (on page 181) that the next book is referred to as *The Undersea Mountain Mystery*. This mistake was corrected in later printed cover copies of this book, but why the mistake was made in the first place I do not know. Perhaps the name of the next book was changed after this book was written...

#11. Tom Swift and his Deep-Sea Hydrodome (1958)



Summary: First, let me say that the picture to the left was sent to me by Greg Weir, and the summary was sent to me by Tom Ippolito. Thanks a lot!

From the moment Tom swift finds himself tossed about helplessly in an undersea geyser to the time he faces possible death at the hands of his enemies, the young scientist fights to overcome many obstacles in putting his two latest inventions to use.

When Tom discovers that helium on the ocean bottom had caused a geyser, he plunges into the task of building an underwater city of derricks and pipelines to capture the gas. His astounding new water-repelling machine and phenomenal hydrodome make the gigantic operation possible.

While at work at the undersea mountain site, Tom and his pal Bud Barclay uncover what seems to be a pirate treasure, but find in the leaden chests a cache of death-dealing destruction. Time and again the young scientist's plans are nearly wrecked. A sinister, hooded figure attacks him in his laboratory, and a mysterious submarine nearly costs him his

life.

How Tom outwits his ruthless enemies and saves his country from grave danger makes a nerve-tingling story, packed with swift, tense action and high voltage suspense.

Major Inventions

There are a number of inventions and structures in this book, but they are all based on one invention: the **repelatron**, so I'll deal with it first. The repelatron was created to solve a complex problem -- how does one mine a helium well located 13,000 feet below the surface of the ocean? Tom thought about it for a while, fiddled in his lab, and came up with a fantastic device that can repel anything. Equipped with such a device, he tuned it to repel seawater, sank it beneath the sea, and founded his first great undersea city. Later, Tom Swift used his device to power spaceships, pour roads in the sky, and create a flying car, among other things.

How does the repelatron work? First, let me say that I have doubts as to the feasibility of the book's explanation. If repelatron were that simple to build we would have had them a long time ago. However, since the book's explanation is the only one I have, I'll give it anyway:

..."All right. You wanted to know how I propose getting the helium in large quantities. I believe the only feasible way is to sink a huge air bubble over our drilling setup. We could maintain a breathable atmosphere inside the bubble and work there."

"A huge air bubble?" Dr. Clisby frowned. "I'm afraid I don't understand. How could such a bubble be formed?"

"That's where my new invention comes in," said Tom. "It's a selective matter repeller. I've named it the repelatron. If it works out successfully, we could use it to repel the water all around us, thus creating a livable air space."

"How does your repelatron operate?" Bob Anchor inquired, greatly intrigued.

Tom grinned. "Well, here's the principle. As you know, matter is made up of molecules, which in turn are composed of atoms. And each atom has a central nucleus with one or more electrons orbiting around it, like tiny planets going around a sun."

As the young inventor paused, Bud Barclay said, "I get the idea so far. But keep it simple."

"Well, the inner arrangement of these atoms is different in each kind of matter. For instance, iron has one kind, carbon another. And because their atoms are different, they each give off a distinct type of radiation, which can be seen under a spectroscope."

"Quite so," agreed Dr. Clisby. "And by studying the color spectrum of its radiation, we can identify what kind of matter we're looking at."

"Sort of a chemical fingerprint in Technicolor." Bud chuckled. "Is that right?"

"Precisely," Dr. Clisby replied.

"The molecules in sea water," Tom went on, "are made up of various kinds of atoms, each of which gives off its own special radiation, as I just explained. If I can pick up and analyze the radiation at the helium wells, and then generate a counter-radiation wave, I can repel the sea water."

"That's right," said Bob. "This counter-radiation will be exactly out of phase with the incoming radiation -- and thus exert a repelling force on the sea water."

"Right."

...

"Well, that gadget [his resistorizer] was a radiation neutralizer because it changed the knockout waves that were fired at us into heat. What my new repelatron will do is simply to hurl back any source of incoming radiation waves. In other words, the two opposing rays will repel each other, just like to similar poles of a magnet."

...

"How are you coming, skipper?" he inquired.

Tom laid down his soldering fun and wiped the perspiration from his forehead. "Almost done -- with the improved pilot model, anyhow. Keep your fingers crossed."

Bud stared at the compact but tangled mass of electronic parts and shook his head. "Looks like spaghetti to me."

Tom burst out laughing. "Actually it's quite simple. There are only six main parts to the gadget."

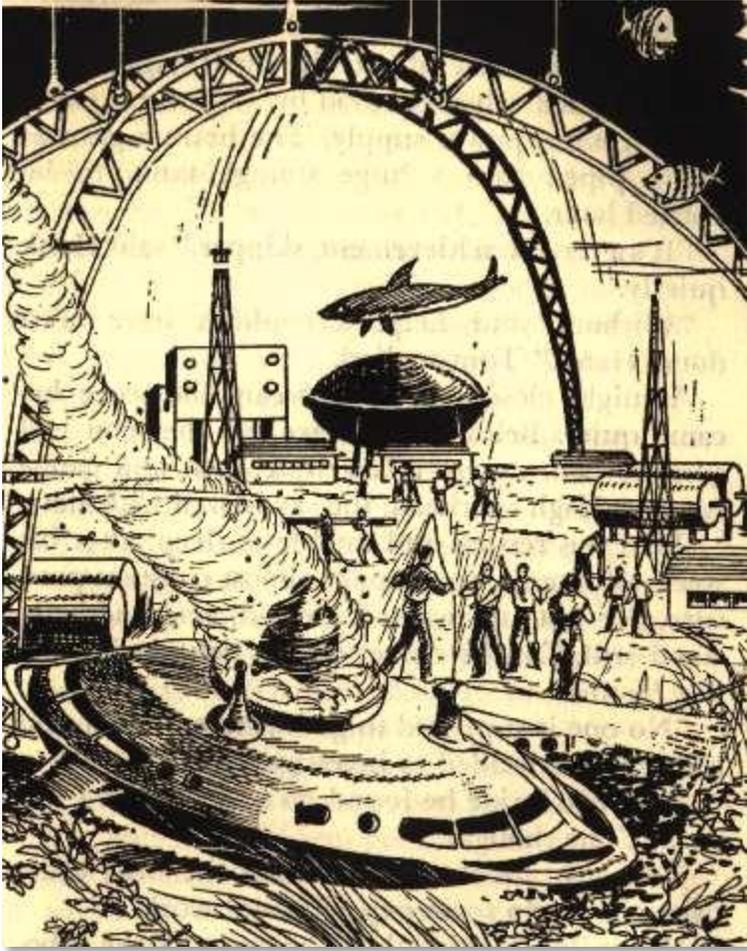
"Go ahead and name 'em -- just to confuse me," Bud retorted.

Well, first, this is the detector, to pick up the radiation from whatever we want to repel -- in this case, water. Then there's an analyzer to break down the radiation into its separate components; an amplifier to boost the strength of the signal; and a phase inverter to put the radiation exactly out of phase."

Tom paused and grinned at Bud, whose eyes were already assuming a glazed look. "Next is the power amplifier to produce the output wave. And last is the radiation which sends out the radiation to repel the water."

How feasible is it to build a repelatron? The repelatron is such a fantastically useful device -- it even beats antigravity for usefulness -- that there has to be a catch in it somewhere. I'm not really sure just what that catch is, but I'm sure that it's there. Even so, though, I would imagine that someone, someday, will figure out how to selectively repel matter. We might be in for a mighty long wait, though...

How much impact would a repelatron have on civilization? A repelatron would be an enormously useful device. There are many, many places that a matter repeller could be used. Some of them are obvious, and some are not so obvious. A few of the things I have come up with are:



with an atomic-powered repelatron, you could easily and cheaply tour the galaxy -- as Tom Swift did in his Cosmotron Express.

- Mineral identification. A repelatron -- as Tom Swift demonstrated in Tom Swift and his Aquatomic Tracker, is extremely useful in the identification of compounds. Tom Swift showed how useful this feature is by creating a submarine that can track other submarines by the chemical residue they leave behind in the water!
- Weather and famine prevention. A repelatron tuned to repel water would be very effective at stopping rainstorms. No longer would rivers have to flood and football games have to be rained out -- just turn on your repelatron and divert the water elsewhere. This might also be useful in getting water to deserts or dry areas -- a repelatron system should be able to get water wherever you needed it.
- Can anyone else think of any more uses for this fascinating invention? I'm thinking about creating a page devoted solely to this unique invention, so if you can think of any more uses and e-mail 'em to me I'd appreciate it.

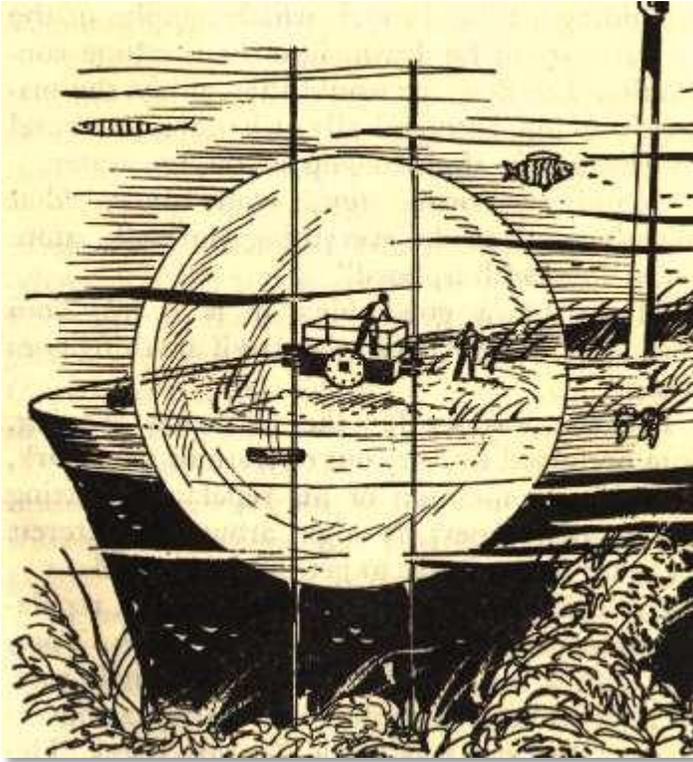
There are two other things that Tom Swift created in this book that depend on the repelatron. One of these inventions is his Undersea City, which he built to mine the helium wells he discovered underneath the sea. (It should be noted that this isn't the only undersea city he built -- Tom Swift created another one over a city of gold in Tom Swift and his Spectromarine Selector.) The concept of constructing a vast city underwater is not unique, but Tom's method of creating such a city certainly is.

- Flying machines. The repelatron can turn any vehicle into the ultimate flying machine -- a specially built vehicle could quickly and precisely maneuver on land, air, water, or in space. (Now wouldn't that be a neat vehicle to have! You could take weekend jaunts to England, or the Moon, or the Marina Trench...)

- City construction. A repelatron, as Tom demonstrated in this very book, could easily be used to create an undersea city of whatever size you desired. Using slightly different principles, it could also be used to create cities in the sky.

- Road construction. A repelatron, as Tom showed in Tom Swift and His Repelatron Skyway, could easily be used to create roads in the sky -- or bridges over the ocean. In fact, with a repelatron, there's little difference between going over water or over land, so distinctions like "bridge" and "road" would be archaic.

- Spaceship propulsion. A repelatron is a scientist's dream -- it can take electricity and turn it directly into thrust. Equipped



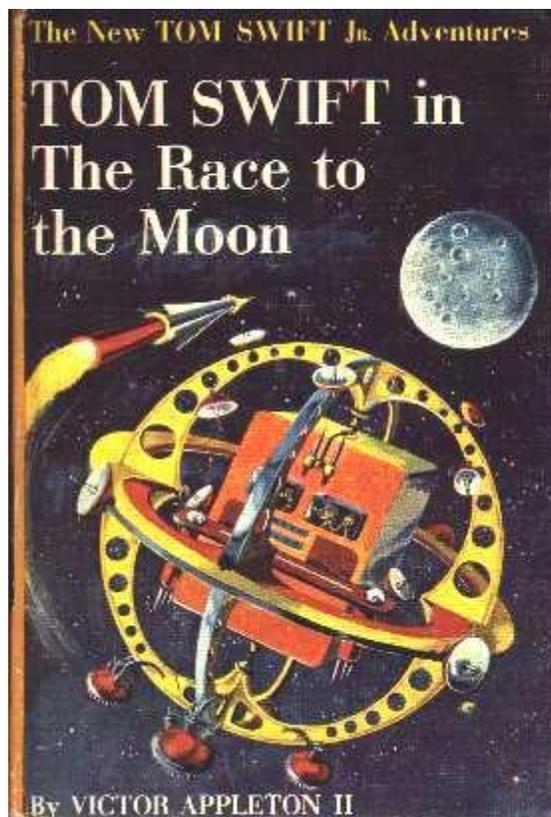
The city (there's a picture of it a page up or so) is basically simple. A large repelatron (or several, I'm not really sure) is hauled underneath the city. The repelatron is activated and creates a huge "hole" in the water. The hole is constantly filled with air extracted from the ocean. To keep fish from falling into the city -- and to keep the humidity to a bearable level -- four large steel girders were erected over the city and a transparent plastic dome was put over the girders.

There were two methods of entering the city: you could ride an elevator down to the bottom of the ocean or you could go down in a submarine. Once down, you simply got out of your submarine or elevator, walked over to the dome, opened the door, and walked in.

The other invention in this book is an undersea elevator. I've scanned in a picture of it and placed it to the left, so you could see what it looks like in action. Basically, it's a steel platform tethered by two long cables that has a repelatron mounted on it. By adjusting the size and buoyancy of the air bubble created by the repelatron, the ship can maneuver vertically.

The device was used by Tom to ferry his men to his Helium City; however, he also used it for other purposes. In the above picture, Tom Swift is using this elevator to salvage a ship. As you can see, it's a unique experience -- the deck upon which the repelatron sits has been made perfectly dry, and Tom Swift can just walk (not swim) to the ship's safe. Wouldn't it be neat to have a device like that to salvage ships, or to explore the ocean bottom? One could really get some exploring done then!

#12. Tom Swift in the Race to the Moon (1958)



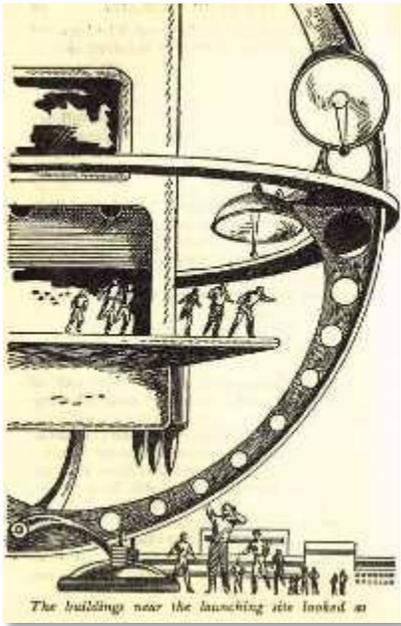
Summary: The following summary was copied from the dustjacket of the book and sent to me by Michael Ponte. Thanks, Michael!

SPEED-AND MORE SPEED-go into the mammoth project of completing Tom Swift Jr.'s newest type of spaceship. It is a race against time and the stakes are high. First, Tom's foreign enemies appear ready to launch a manned moon rocket of their own. Second, the young inventor's friends on another planet propose a rendezvous in outer space, in the desperate hope that Tom and his scientist associates can help them conquer the unknown disease that threatens life on their planet.

From the first test flight to the day the Challenger roars moonward, Tom meets with frustrations and sinister perils, more challenging than he has ever encountered. In a neck-and-neck race with the enemy's rocket ship, Tom's fabulous invention, the super-repelatron, plays a dramatic part in heading off a crash landing on the bleak planet. One of the greatest thrills of the young space pioneer's life comes when he guides the Challenger alongside his planet friends' spaceship.

In this fast-moving, gripping drama of Tom's double victory in outer space you will find all the exciting elements that have made the Tom Swift Jr. series the Number One choice of boys who thrill to mystery and adventure.

A Word on the Drawings of the *Challenger*



If you look at the cover of this book you might get the idea that the *Challenger* was a relatively small spacecraft. After all, if it was so large, why can you see the people in the windows? The *Challenger*, however, was anything but that -- it was a positively enormous craft, as the picture to the left of this paragraph points out. The reason the *Challenger* looks so small in the cover is because of an order by the publisher of this book, stating that Tom Swift's face must always be visible on the cover of a book.

While I'm at it, I might as well point out that the *Challenger* was more or less always depicted wrong in the other Tom Swift books that featured it. Sometimes -- as in *Tom Swift and His Megascope Space Prober* -- the *Challenger* was drawn like a normal rocket ship and completely lost its unique gyrosopic look. Often times it was drawn many sizes too small.

Major Inventions

The major invention in this book is the **Challenger**. The *Challenger* (which, as Bud pointed out, looks like a souped-up gyroscope) was built by Tom to take him to the moon -- and take him to the moon it did, with such tremendous speed as to get him there in only a few hours, instead of the three days it took the Apollo astronauts. While he was in his great moon race he had quite a bit of excitement with the evil scheming Brungarians and managed to help his space friends out of a dire calamity as well (but I won't get into all that).

Before I go on, I'd like to say that the *Challenger* is one of Tom's few inventions that figure prominently in other books besides this one. Many a time Tom Swift let his invention sit on the shelf while he went and invented something else -- but the *Challenger* is one of the few exceptions. Tom Swift used it quite often for interplanetary travel (such as to the deadly comet in *Tom Swift and the Mystery Comet* and to Planetoid Pete in *Tom Swift and the Captive Planetoid*), for trips to his Outpost in Space (as in *Tom Swift and the Galaxy Ghosts*), and to rescue a friend in need (as in *Tom Swift and His Megascope Space Prober*).

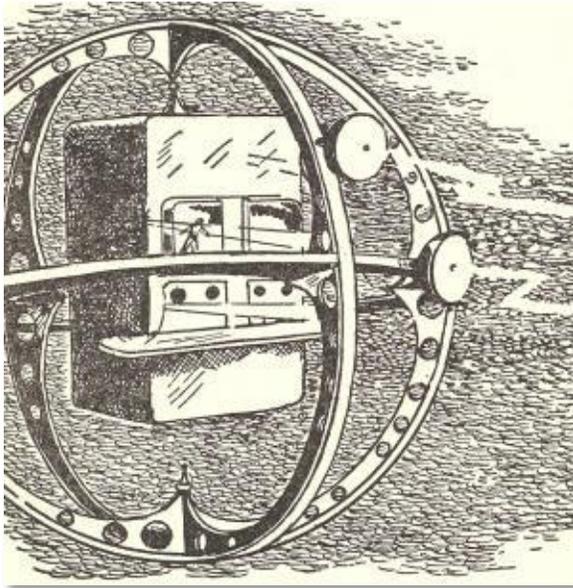
How does the Challenger work? The idea behind the Challenger, states the book, is simple: sunlight streaming from the sun is converted by solar panels into electricity, and the electricity is used to drive Tom Swift's amazing repelatrions, which provide motive power for the spaceship. Here is what Tom Swift had to say about it:

"But, Tom, how can you beat 'em in *this* space jalopy?" Bud asked. "I can't make head or tail of it."

Tom grinned at his friend's puzzled stare. The new spaceship was indeed a weird-looking craft. Its huge box-like cabin hung suspended in a spherical framework of track rails.

"Looks like a souped-up gyroscope," Bud added, stepping back for a better view. "You sure it'll take off?"

The young inventor laughed. "I'm hoping it'll do a lot more than that, fly boy. This ship should be able to go anywhere in the solar system with no stops for refueling."



"Are you kidding?" Bud gasped. "Any rocket ship burns fuel, doesn't it?"

"Sure, but this won't be a rocket ship. Just a spaceship drawing energy from the sun. My craft's power units will change this energy into electric current for running a super-repelatron."

Tom's basic research had led him to the discovery of a previously unknown electromagnetic radiation given off by each element and its isotopes. As a result of this discovery, Tom has invented the Swift spectroscope. Later, he had developed a device that could reproduce this new type of radiation. Tom had found that by having this

radiation out of phase with the natural radiation of the atom, a repelling force was set up. This force, when used to hold off seawater, had made it possible to tap helium-gas wells on the ocean bottom, as related in Tom Swift and His Deep-Sea Hydrodome. Now Tom was trying to use such a force to hold up an aircraft while it was in flight.

"You mean the repelatron will actually be the ship's drive system?" Bud asked.

"You might call it that," said Tom. "At least it will drive the ship forward by pushing us away from the earth or any other body in the solar system."

...

"Brief me again on it, will you? The husky young flier urged.

Tom grinned. "Well, if you've ever looked through a spectroscope, you know that every substance gives off its own special kind of radiation."

Bud nodded. "Sort of like a rainbow trade-mark."

"The word is spectrum, remember chum?" Tom said.

"Okay, professor. And your repelatron detects this radiation and generates a counter-wave that is exactly out of phase with it. So when you aim it at a substance, the counter-wave acts as a repelling force. It pushes the substance away, just as opposite poles of a magnet repel each other."

"Correct, Bud."

"But," his pal objected, "the repelatrons you've built so far just repel one particular substance -- like water. Now you're going to build a machine which will repel anything in the solar system?"

"Right. That's my big problem. It will have to work for all the ninety-two natural elements."

Bud whistled. "Pretty neat, pal! But what happens if you want to change course?"

Tom turned toward the mock-up of the spaceship. He pointed to the dish-shaped antennas that ran on circular tracks around the ship. "We can beam out repulsion waves on any of these three directional radiators. By swiveling them around, we can line up on any object in space and give ourselves a kick in the right direction."

"Suppose you're traveling on the dark side of the moon," Bud objected, "or some place where you can't get power from the sun to work the repelatron. Then what?"

"Chances are we'd still have enough momentum to carry us out of the moon's shadow," Tom replied. "But just in case we want to maneuver or change directions in the dark, the ship will have auxiliary rockets. They'll also be used to assist us on take-off. "

How did Tom Swift tap sunlight to get the energy needed to power the Challenger?

"One thing you still haven't explained, Tom," Bud remarked after the engineer left them.

"What's that?"

"How are you going to draw power from the sun to operate your repelatron? Wouldn't your solar batteries do the job just as well?"

Tom shook his head. "They just soak up power from the sun's *visible* light rays. But that's only a small part of the sun's total output. For this job, I'll need to tap all the energy we can get, including the rays above ultraviolet and below infrared."

"You mean a lot of it's going to waste?"

"Sure is, pal." Tom whipped out his slide rule. "If we could harness all the sun's energy, down here on earth, we'd get more than three horsepower from every square foot of surface exposed to the sunshine."

"Then grab it, Tom." Bud grinned. "But how do you tap all this power?"

"Remember those big gadgets like searchlights on the spaceship cabin?" Tom asked.

Bud nodded.

"Well, those are the conversion units which will collect the sun's energy and change it into electricity by photochemical action."

How was the *Challenger* laid out?

More than ever the gleaming spaceship looked like huge gyroscope poised on four hydraulic landing struts. At the center was the cube-shaped cabin or fuselage. Auxiliary rocket tubes projected below.

"Those polished cups mounted on the cabin are the energy-conversion units," Tom pointed out. "And as I told you, the repelatron radiators run on those outside tracks. Incidentally, a special meteor-repelling machine will be turned on all the time."

"Thank goodness for that," said Bud. "I'd hate to have a meteor hit us. Say, what's this? Looks like a front porch" he added, as they climbed up to the cabin.

"Landing platform for auxiliary ships," Tom explained.

"You mean this ship will carry smaller crafty?" said Bud.

"That's right. They'll be berthed in here." Entering through an air lock, he showed Bud a large hangar compartment. "Then there's a machine shop for emergency repairs on each side, with laboratories above them."

They walked through the starboard shop, equipped with lathes, welders, and other tools, and entered a small elevator. Tom pressed a button and they zoomed upward.

"This is the top deck," Tom said as they stepped out. They were in a small compartment containing banks of electronic computing gear. "These computers will feed our navigation equipment and also compute the tapes for our automatic pilot when we operate on auxiliary rocket power," he explained.

"This ship is sure loaded with brains!" Bud grinned. "Not counting me."

Next came the ship's control room where the pulps, gauges, and air-conditioning equipment were installed. When they entered the flight compartment, Bud's eyes popped when he saw the rows of gleaming dials, levers, and switches.

"What a setup!"

Bucket seats for pilot and copilot stood in front of twin quartz glass view panes. At the left was a huge fluorescent screen and at the right a multi-dial panel labeled with names of the planets and other heavenly bodies.

"I'll check you out on all these controls tomorrow, just before we take her up," Tom said. "Right now, let's see the other sections."

Beyond the flight compartment was another small room full of mysterious dials and electronic gear. "This is the radiation-control room," Tom explained, "for monitoring the gamma and cosmic radiation received by the ship. And this next door leads to the power room, where we handle the electrical output of our solar-conversion units."

Gliding down in another small elevator on the ship's portside, Tom pointed out the rooms that honeycombed the lower level. There were bunkrooms, living quarters, and a galley. On the bottom deck were air and water storage and purification plants, auxiliary engine room, and compartment housing the repelatron gear.

"My head's spinning, genius boy!" Bud said. "With this layout, we could fly to another galaxy!"

"I'll be satisfied if we make the moon." Tom chuckled, adding, "If we do, we'll have sure proof of the whole trip. I have a tape recorder aboard."

What were all the gadgets inside the *Challenger* for?

The boys climbed up the accommodation ladder and entered the ship's air lock. When they reached the flight compartment, a puzzled look swept over Bud's face. "Hey, you've forgotten something, Tom!" he said.

"What's that?"

"The acceleration cots."

Tom chuckled. "On this ship we don't need them."

"*What?*" Bud was baffled.

"In a rocket ship you get tremendous acceleration from short blasts of power," Tom explained. "But with our energy-conversion units we can get a steady supply of power from the sun. So we can accelerate gradually to high speed, without taking so many G's all at once."

"Now you're talking!" Bud said enthusiastically. "No more getting the daylight's crushed out of us!"

Tom nodded. "It simplifies a lot of things. For instance, we won't need automatic tape control at blast-off, because we can adjust our steering in fine amounts any time we want to."

"Terrific!" Bud said. "Now, how about briefing me on all these control gadgets?"

Tom pointed to a row of indicator lights and push buttons above the pilot's windows. "This is the element selector panel," he said. "As you can see, it lists all the ninety-two natural elements."

"Just push the button for whatever element you want to repel?" Bud asked.

"Right. And these dial switches below let you select the exact isotope. They work through this interplugging board."

"Pretty neat! And this is the astro-gyrocompass, eh?" Bud pointed to an instrument on the central control board.

"Yes -- for steering operations after the ship is underway," Tom told him. "And these big twin dials are the power indicators."

He explained the various levers for operating the directional radiators and auxiliary rockets. Then Bud asked about the huge fluorescent screen on the left.

"It's the space position finder," Tom replied. "Sort of a space radarscope."

He flicked a small toggle switch. As the screen lighted up with ah um, he tuned several knobs. Instantly the lower half of the screen was painted with a reddish phosphorescent glow.

"It'll look like this whenever we've landed," Tom explained. "That red area represents the earth. In flight, we'll see the planets or other objects as round dots, and the color will show us their height above or below our orbital plane."

"How about that panel over on the right?" Bud asked curiously. "The one with all the astro-whoozical names on it."

Tom walked to the right-hand control board, grinning. "As you can see, these dials are labeled for the earth, moon, sun, Mars, Venus, and so on. They tell the distance and relative angle of each body from our spaceship. In other words, they give us an exact reading of the picture shown on the screen."

"But these meters calibrated for thrust -- where do they come in?"

"They tell us how much power we have to feed to the radiators for any desired acceleration," Tom explained.

Did the Challenger have artificial gravity? I think it might have. Why do I think so?

Well, for one thing, the *Challenger* is not laid out to take advantage of a zero-gravity environment. To put it another way, the *Challenger* was designed as if Tom was expecting gravity to be present on board the ship. For example: why would anyone need an elevator (which this book states the *Challenger* had) or set of stairs in a zero-gravity environment? Wouldn't just floating your way up or down be just as easy?



Moreover, if you'll look at the picture to the left of this paragraph, which depicts a scene when the *Challenger* is in Earth orbit, you will notice that there is definitely gravity on the ship. After all, if there was no gravity, why couldn't they simply float up and catch the monkey? The chairs, too, don't have the straps that would be necessary to keep a person seated in them in a zero-g environment. Those light fixtures are suspicious too -- in a zero-gravity environment they could be downright dangerous. And why are all of those people (especially the one that has apparently fallen over) seemingly anchored to the floor?

So, then, I think that it must be assumed that Tom Swift had a way to generate artificial gravity. It is known from previous books that Tom Swift had an "anti-g neutralator" that could temporarily reduce the force of gravity -- perhaps he modified this invention so as to produce gravity instead of annul it.

If Tom Swift did indeed have a way to nullify gravity without the clumsy Serptilium he used in Tom Swift and His G-Force Inverter, then he would have had one of the greatest inventions of all time. And to think that, in the eyes of the publisher, its invention never rated a separate book! If any more Tom Swift Jr. books are written, I think that "Tom Swift and his Gravity Neutralator" should be one of them.

Would the Challenger work the way Tom Swift explained it? I'm afraid not. Why? Simply because there is not enough power in sunlight.

If you'll look carefully at the passage explaining how Tom Swift harnessed solar energy you'll notice that Tom Swift said that he could collect three horsepower of energy for every square foot of earth. Now, assuming that the *Challenger* had a hundred feet of collection space (which is highly unlikely -- it probably had only 20 or 30 feet of collection space), Tom Swift could thus get around 300 horsepower.

Now there's no way -- let me repeat, there's *no way* -- that Tom Swift could have made the *Challenger* go *anywhere* with only 300hp. To go to the moon, especially at the speed that Tom did in his Challenger, hundreds of thousands of horsepower are needed at the very least, and that energy just *cannot* be found in solar energy.

Still, there is a simple way out of this difficulty: use nuclear power. Tom Swift was always good at harnessing nuclear power to drive his vehicles (hey, take a look at his Flying Lab, or his Triphibian Atomicar, or his Subocean Geotron, or his Cosmotron Express, to name a few -- they're all nuclear

powered). Equipped with one of Tom's special reactors, I think that the *Challenger* could have done all Tom Swift asked of it, and then some.

Could we build a Challenger today? I'm afraid not, folks. We don't have the right equipment to do it. Before we could build a *Challenger* we would need to know how to build a repelatron (which is discussed in Tom Swift and His Deep-Sea Hydrodome), since the whole idea behind the *Challenger* rests on the use of the repelatron. Building a *Challenger* without a repelatron is somewhat akin to building a car without wheels -- it can be done, but the car won't go anywhere. So, unfortunately, we must wait. Perhaps we'll be able to build one someday, but it won't be anytime soon.

How might a Challenger be used if one were built today? The *Challenger* would be, as one might imagine, an enormously useful craft in the exploration and settlement of space. I think that it would be the key, if you will, that will unlock the door to the solar system.

Up until now the exploration of space has been largely curtailed because of the tremendous expense and the equally tremendous technical difficulty. Getting into space is a tremendously, monstrously difficult task, and staying there is even more difficult. The *Challenger*, however, offers a cheap, fast, and reusable way into space -- the three things that space engineers have been working toward for decades. Space flights, with a *Challenger*, could be much cheaper, much longer, and employ more personnel. More satellites could be launched for far less money than is currently thought possible. Space stations far bigger than the ones currently composed could be set up. Lunar colonies spring up and have supplies shipped in. Trips to nearby (and later more distant) planets could take place, and perhaps colonies on them could be established.

Get the idea? Almost everything that we have ever dreamed of doing in our solar system would be made far easier with a *Challenger*. It holds tremendous, perhaps unparalleled promise. Now all we have to do is to invent one...



Other Inventions. In this book, Tom Swift invented another device that he used quite frequently: his **repelatron donkey**. A Repelatron donkey is, well, it's kind of hard to describe. I've scanned in a picture of it for you (it's sitting right there to the left), so you decide what it looks like.

The purpose behind the repelatron donkey is very simple: it acts as a convenient and simple transport device on extraterrestrial surfaces. It excels at this, too -- it's small enough to be stored in very little space, it's simple to make, and yet it can carry large loads or several people across rugged and impassible terrain. Tom only used it on extraterrestrial soil, but I think that there could be a strong case of a need for one here.

Here is what Tom had to say about the repelatron donkey:

Chow paused as his eye fell on the new device Tom was making. "Say, what's this do-jigger yo're workin' on now? Somethin' new?"

The young inventor nodded. "I've decided to call it a 'flying carpet' -- or maybe a 'repelatron donkey.' "

Chow squinted at Tom suspiciously. "Brand my buffalo stew, if I didn't know the things you cook up sometimes, I'd think you was pullin' my leg. What's this contraption supposed to do?"



It consisted of a flat, thin-metal platform about three feet square, with a six-foot length of wire leading to a small pocket-size control box. A metal housing built into the platform contained electronic gear.

Tom smiled at the look on Chow's face. "I wouldn't kid you, old-timer. That's really what it is -- a sort of flying carpet. It's for use on the moon, to transport persons or supplies. You see, the terrain's pretty rugged up there, with lots of clefts and crevasses, so ground travel will be difficult."

"How's this thing work?"

"Well, the housing here contains a repelatron. Underneath there's a fixed radiation to direct the repulsion beam downward so as to hold its passenger suspended above the ground. There's also a swivel-mounted radiator for

steering the platform in any direction."

"How about that li'l ole box on the end of the wire?"

"That's the control box," Tom explained. "The operator will hold it in his hand while he's standing on the flying carpet."

Chow scratched his bald head. "Sounds pretty neat, Tom. Only ain't that metal kind o' thin for haulin' heavy loads?"

"Not on the moon, Chow. Up there, the pull of gravity is six times weaker than on earth. So objects will only weigh one-sixth as much."

A Swift Enterprise Rocket Launch

In this book, Tom Swift travels to his Outpost in Space to investigate the moon and try to find a good landing site. To travel to his Outpost in Space he must, of course, take a rocket, and the preparations and liftoff are covered in the book.

The reason I am bringing this up is to point out that Tom Swift had space travel down to a science much, much more than we do. For NASA to launch a rocket into Earth's orbit hundreds of millions of dollars are required and the preparations and countdown for the launch take weeks. The whole procedure takes hundreds of highly trained men who must stay in contact with the spacecraft the whole time it is in orbit.

With Tom Swift, however, travelling into Earth orbit is a simple job that takes only a few minutes. Ground crews (not counting the hordes of mechanics that check out his rocket) are limited to a few men, and once liftoff is complete automatic computers take over.

I've typed up the Swift rocket launch for you, so that you can see how easy Tom Swift really had it. Hope you enjoy it, and marvel over what little idea science fiction writers had of the real trouble behind a rocket launch.

Blast-off was scheduled for two o'clock the following afternoon. Instead of using his rocket ship, the Star Spear, in which he had first conquered outer space, Tom decided to ride one of the atomic cargo rockets that shuttled between the space wheel and Fearing Island.

"Fuel's all loaded," Bud remarked as the two boys approached the launching area.

The last tank truck was driving away. Mechanics swarmed over the huge silvery projectile, checking valves and tightening connections.

As the moment for take-off approached, radar scanners swept the sky. The boys rode by conveyor up to the pilot's compartment in the rocket's nose, high as a five-story building.

"All hands clear the launching area!" a voice boomed over the "squawk box."

In the flight cabin, Tom spoke into the mike. "Radar report!"

"All clear!" George Dilling called back.

Tom fed the flight tape into the automatic pilot. Electric timers began ticking in the concrete blockhouse. The boys lay flat on their acceleration couches and buckled the straps.

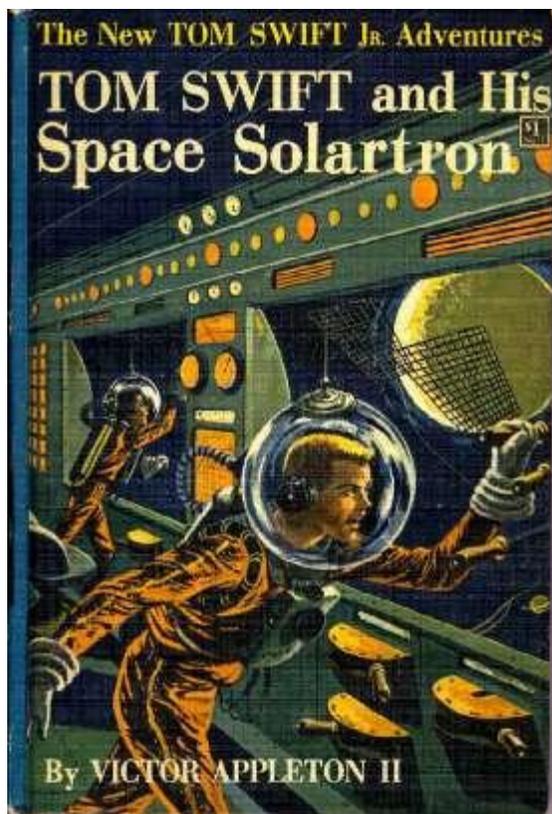
"X minus twenty second!" blared the loudspeaker. "X minus nineteen...X minus eighteen..."

...

Bo-o-oom! Smoke rolled over the launching area. For an instant, the rocket seemed to be poised on a pillar of fire. Then it was arrowing upward into the blue at lightning speed.

The shock of acceleration flattened the boys against their cots. Gradually the pressure eased off as Tom's anti-G neutralator took effect. Moments later, a red light flashed and a warning buzzer sounded as the timer gun kicked loose the first stage of the rocket. A fresh blast of power shook the cabin. One by one, the other two stages were jettisoned.

#13. Tom Swift and his Space Solartron (1958)



Since my copy of this book does not come with a picture cover, I was unable to provide a scanned image. Greg Weir, however, has scanned his copy of this book and sent the scan to me. Thanks, Greg!

Summary: Extracted from the dustjacket of the book:

A MIGHTY TASK faces Tom Swift Jr. in his exciting, new project - colonization of the moon.

To accomplish this astounding feat, Tom must perfect his latest invention, the matter maker, which will be essential for life on the moon. Not only must this amazing solartron manufacture oxygen and fuel, but also food and other materials in sufficient quantity to support the moon pioneers for some time.

From the moment the young scientist-adventurer starts planning for this daring venture, danger and mysterious happenings plague almost every step of his progress. A crushing blow comes when he discovers that one of the solartron's precious secrets has fallen into the hands of an unscrupulous scientific group. Unwilling to admit defeat,

Tom and Mr. Swift proceed to their Outpost in Space to conduct crucial tests on the matter maker.

Just as success seems assured, the young scientist suffers the most devastating blow of all when his father mysteriously vanishes in the dark void of endless space. Frantic, Tom instigates a search that leads to the farthest planets.

As you read this taut, nerve-tingling story of Tom's exploits, you will live every tense moment of his triumphs and electrifying adventures.

Major Inventions

The main invention in this book is, of course, the **Space Solartron**. The *Space Solartron* was probably Tom Swift's most amazing -- and far-fetched -- invention. Its purpose was to make space travel practical by creating oxygen, water, and food from sunlight -- not a simple task, to be sure. How did he do it? Read on...

How did the Space Solartron work? Before I forget: when I first posted this summary, I was completely, totally, absolutely wrong in my explanation of the mass/velocity matter. I discovered my rather serious error when a person named Larry Smith sent me a letter explaining my mistake. Thanks, Larry!

The mathematics behind this invention is quite complex, so we are going to have to back up a little bit and establish some background. Please bear with me for a minute...

During the earlier part of this century a famous scientist named Albert Einstein developed two very famous theories that dealt with something called *Relativity*. In those two theories, Einstein pointed out an incredible fact: your mass is a factor of your speed. Simply put, as your speed gets closer to the speed of light, your mass also increases, until when your speed is equal to the speed of light your mass is infinite. (This, by the way, is why nothing that has mass can go faster than the speed of light. Think about it for a moment: how can you increase the speed of an object that has infinite mass?)

What does relativity have to do with Tom Swift? Well, when the authors of this book heard this mass/velocity principle, they thought that they could use it to create matter. The principle would be simple: all you would have to do is accelerate an atom in a particle accelerator until its mass started increasing enormously. Then, when you had all the mass you wanted, you turned off the machine and *voila!* you have instant mass. This will not work (the atom's mass will return to normal when you slow the atom down), but it does make a good book.

If you didn't understand what I was saying, don't worry. Tom Swift explained it pretty well, so take it from him:

"Calling Tom Swift!"

"Power failure in the wind tunnel!"

"Hey, the presses have stopped in the metal-stamping department."

Excited voices blared out over the loudspeaker in Tom Swift's private laboratory at Swift Enterprises' vast experimental station. The telephone was jangling shrilly. A lanky, blond youth of eighteen with deep-set blue eyes switched off his experimental equipment and scooped up the receiver.

"Tom Jr. speaking."

"For Pete's sake, take it easy, skipper!" gasped a voice at the other end of the line. **"You've popped the main circuit breaker!"**

"The load's off," Tom reported. **"I just stopped my experiment."**

As he hung up, a husky dark-haired youth burst into the laboratory. **"Hey, what's going on, genius boy?"** Bud Barclay demanded. **"Are you trying to sabotage this place?"**

Tom grinned wryly. "Relax, Bud. I was just running a test on my new matter-making machine. I arranged with the power plant to cut in the stand-by generator, but even that wasn't enough to handle the current load."

Bud slumped down on a lab stool and mopped his forehead. "Whew! I thought someone was blowing up the joint! Even the radio tower started to--"



Suddenly his voice trailed off and he stared at the young inventor. "Did you say a *matter-making machine*?"

Tom chuckled at the surprised look on his friend's face. Bud Barclay was his closest chum and acted as copilot on Tom's air and space flights.

"That's right, pal," Tom explained. "This pilot model rigged up on my test bench is designed to turn electrical energy into matter."

Bud shook his head. "Man, that'll be a better trick than pulling a rabbit out of a hat. You'll be making something out of nothing!"

"Not exactly." Tom grinned. "You wouldn't call an atomic explosion *nothing*, would you?"

"I'd say it's nothing to fool around with,"

Bud quipped. "Why?"

"Well, with atomic fission, you're turning matter into energy. This setup does just the reverse. Both cases depend on Einstein's famous equation $E = mc^2$, which means that energy and matter are interchangeable. They're simply two different forms of the same thing."

Bud scratched his head thoughtfully. "Like water and ice, I suppose. Sounds good, but how do you do it?"

Tom grabbed a pencil and paper. "It's quite simple, really -- at least the idea is simple. Einstein has shown that as matter approaches the speed of light, its mass increases. He worked it all out in this one little equation."

As Tom's pencil flew over the paper, Bud gulped. "You call that one *little* equation, pal? Looks like a whole night's homework in math to me! Keep it simple, please."

"Okay." Tom laughed. "What my new invention does is take a particle of matter and whirl it around faster and faster until it's going almost at the speed of light."

"And the faster it goes, the greater its mass?" Bud asked.

"Right. In my experimental rig, the results only show up as a slight increase of mass on this platinum screen that I'm using as a target. But I'm building a new model which I hope will produce enough matter so that I can actually weigh it."

"Wonderful, processor!" Bud exclaimed, slapping his pal on the back. "But what's this machine for -- a scientific magic show?"

"No," Tom replied. "It's to help us explore space -- perhaps colonize the moon."

Bud's eyes grew round with excitement. "Now you're talking my language, skipper! Give me the low-down!"

"Well, on the moon, or when we're traveling through space," Tom explained, "we'll be cut off from our source of supplies. If this machine could produce oxygen, water, maybe even fuel and food, then we could exist away from the earth as long as we wanted to say."

"Wow!" Bud bounced off his lab stool. "That means we could *really* explore space, Tom -- even visit the farthest planets!"

The young inventor nodded, grinning. "Exactly. But don't get your hopes up too soon, pal. My machine isn't perfected yet, and I'll need a lot more power to carry out my experiments."

What did the machine look like? In the words of Tom Swift:

"Where do you want the pots hung, skipper?" the foreman called down, jerking his thumb toward the transformers.

"Mount them on the roof," Tom called back. "I'll take over from there."

"You'll have a regular substation here," Ted commented. "What's the setup?"

"These high-tension lines will bring in 10,000 volts from the powerhouse," Tom explained. "and the transformers will step that down to 480. You see, my work will require low voltage, but very high amperage."

While the linemen were busy erecting the transformers, Tom went into the laboratory and began setting up the first model of his matter-making machine. Bud and Ted watched, fascinated, as the young inventor worked dexterously. "Let me see," Tom muttered. "Electromagnet -- okay. Castings -- check." He turned and glanced at his blueprints. "Vacuum system -- then the electronic controls."

"How does he do it?" Ted muttered to Bud. They gaped in awe as the machine gradually took shape.

A dome about two feet in diameter was supported on a column above a broad circular housing. From this, pipes led to the vacuum pump. The controls were enclosed in a separate console studded with knobs, dials, and oscilloscopes.

"Boy, I'd sure hate to have to trouble-shoot this little gadget!" Bud wagged his head.

"Sort of a miniature atom smasher, isn't it?" Ted asked.

"Works on the same principle," Tom explained, "but a better name would be a particle accelerator. An atom smasher uses high-speed particles to bombard a target and cause artificial radioactivity. This machine speeds up the particles just to make them increase in mass."

"And this housing at the bottom is the particle racecourse?" put in Bud.

"Might call it that." Tom chuckled. "The racecourse is actually an electromagnetic field provided by the magnet. We also have to create a vacuum, so that the speeded-up particles don't go bumping into any air molecules."

What is the biggest problem Tom Swift had developing this invention? The biggest problem Tom Swift had was trying to get enough electricity to power his invention. It takes an *enormous* amount of electricity to create even one gram of mass. The book explained this problem well:

"Suit yourself." Tom smiled. "Here goes!" He closed the switch, feeding power to the machine, and adjusted the control knobs.

There was a steady hum of current as the machine throbbed into action. To everyone's relief, the cooling apparatus did its job effectively and the aluminum bars stood firm. Tom settled down to tending the dials in silent absorption. Bud, Ted, and Chow watched in fascination as an hour, then another, went by. Finally, they left to attend to other tasks.

To everyone's amazement, Tom continued to run the machine throughout the night and into the next day. He broke off his vigil only long enough to eat a few bites of the hot, tempting food which Chow brought him at intervals.

It was late afternoon of the next day when Tom finally called a halt, after operating the machine to the limit of its capacity. Thirty hours had elapsed since the start of the test!

Bud, Chow, and Ted rejoined Tom and gathered around to watch in fascination as he drew off a tiny quantity of gas. He analyzed it in the Swift spectroscope, then measured its mass on a microbalance.

Bud saw the young inventor's face burn bleak. "Failure?" he asked.

Tom shook his head. "Not exactly, fellows. But..." His voice trailed off in discouragement.

"What's wrong, boss?" Chow anxiously asked Tom.

The young inventor smiled wanly. "A million watts of electrical energy! And all my invention produced was this measly amount of gas!"

"But the spectroscope shows that it's pure oxygen," Bud spoke up.

"Yes, which weighs up to exactly one one-thousandth [0.001] of a gram!"

Chow pushed back his ten-gallon hat and scratched his balding head. "Reckon that ain't very much, eh?"

"About enough to keep a flea alive for half a second." Tom whipped out his slide rule and did some rapid figuring. "Chow, with the power I used to make this much oxygen, you could run your toaster an hour a day for eighty-one years!"

How feasible is it to build a Space Solartron? Well, first of all, you couldn't do it the way Tom Swift explained it. His idea of speeding atoms up and then slowing them down when their mass increased just wouldn't work -- when you slowed the atoms down again your extra mass evaporates and you are left back on square one.

However, that doesn't mean it is impossible to create mass from energy. A few decades ago a group of scientists got together and created a few atoms from solar radiation -- that's sunlight, by the way. The process used an *incredible* amount of energy, but it did work.

It's the amount of energy required that is really the death knell of a *Solartron*. You see, even if Tom Swift had built a device that could turn sunlight into matter, the amount of matter he could create is negligible. I have calculated that, with Tom Swift's 40 acres of solar panels that his *Solartron* used, he could create 0.4 grams of matter per second -- which is not very much. Oh, sure, if you were to move the Solartron closer to the sun more mass would be generated, but then its whole purpose (enabling men to explore the outer planets) would be defeated.

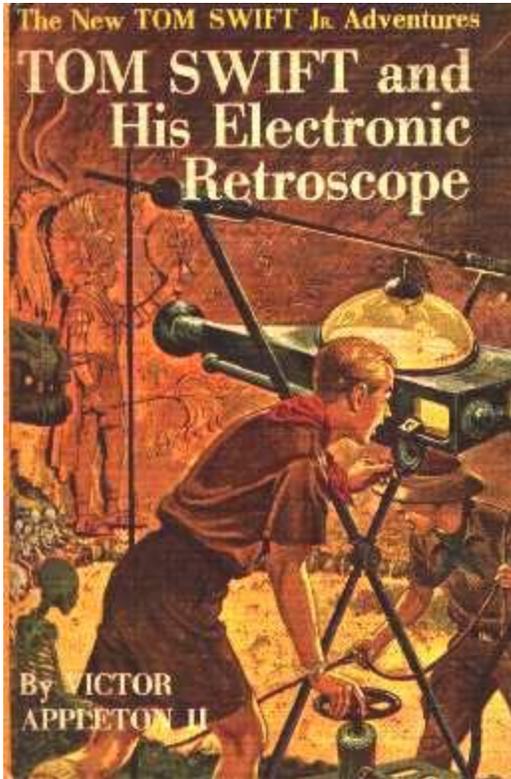
However, there is one other possibility: a nuclatomizer. A nuclatomizer (which is discussed more fully in the Dig Allen book *Journey to Jupiter*) is a device that can turn any kind of matter into any other kind of matter. To put it another way, it could take ordinary rocks or garbage and change them atomically into oxygen, water, gold, or whatever you want. Such a device, I think, would fulfill Tom Swift's purpose.

How much impact would a Solartron have on civilization? A device that fulfilled the promise of Tom's *Solartron* would have enormous impact in a wide range of fields. Think about it for a minute. What would it mean if you could create an infinite stream of mass from sunlight (or, in the case of the nuclatomizer, from rocks)? Mines, of course, would go out of business -- after all, why go through the

trouble of mining the ground if you can get coal, gold, and silicon straight from the sun? The international gold market would fall too, since gold would theoretically be no rarer than steel.

In space there is great promise as well. Fuel and food supplies would no longer be an issue on long voyages -- just take a handy *Solartron* or nuclatomizer and you're set for life. Repairs, too, would not be a problem in an advanced model *Solartron* -- just type in what part you want and the computer could manufacture it for you on the spot. (This could affect manufacturing too, by the way -- imagine if you could create a new car or house for yourself with the press of a button!) Outer space could be easily reached at last. Colonies would spring up on all of the planets, since the last great barrier to space colonization would be broken down.

#14. Tom Swift and his Electronic Retroscope (1959)



Summary: Extracted from the dustjacket of the book:

Enraged Jaguars, violent winds of hurricane force, and a mysterious "giant" who roams the jungle around the Mayan village in Yucatan, Mexico, where Tom is encamped, are only a few of the perils that the young inventor encounters during his thrilling expedition.

But even more feared by the young inventor is an unknown saboteur, intent on destroying Tom's two latest inventions--the electronic retroscope camera and his "parachute" plane, designed for landing in small areas.

Undaunted by the hazards that surround him and assisted by the friendly natives, Tom perseveres in his objectives. He tests his paraplane for landing maneuverability in densely grown jungle areas, and uses his retroscope (magic to the natives!) to restore--photographically--ancient carvings and writing on old Mayan relics. Tom is astounded when he discovers that some of the carved symbols are similar to the mathematical symbols used by his mysterious friends in outer space to communicate with him.

Is it possible, Tom wonders, that beings from another planet actually landed in Yucatan centuries ago?

What happens to Tom and his friends as they seek the answer to this question in the dark depths of a buried temple will hold every reader in gripping suspense to the last line of this challenging adventure.

Major Inventions: The Electronic Retroscope

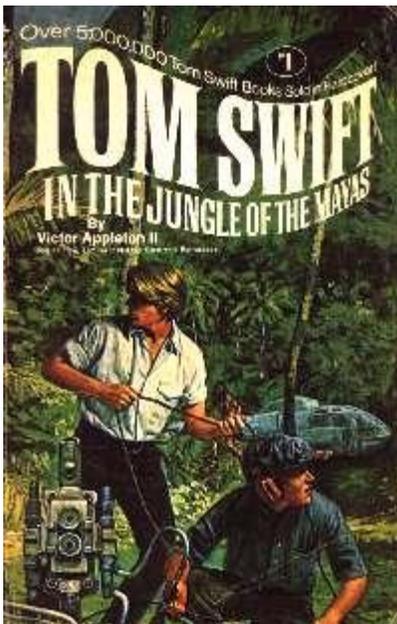
(The summary below was written by Graeme Woods. Thanks for volunteering!)

The **Electronic Retroscope** is the major invention of this book.

What does the Electronic Retroscope do? The Retroscope is a television like camera that allows one to see what an old, worn object used to look like. For example, Tom used it to photograph a worn stone carving to read the original inscriptions. The book describes it as follows:

Tom's latest invention was designed to "see" what a rock face - or any other surface - looked like originally, before being exposed to wear or erosion. Tom believed that it would prove highly useful in scientific research by geologists, archaeologists, and paleontologists.

Tom explains that the name of his invention is formed from Greek and Latin words meaning "to see back".



How does the Electronic Retroscope work? The book is initially a bit vague about the operating principles of the Retroscope. It says:

The camera was based on two earlier achievements of the Swifts. One was Tom's discovery of a hitherto unknown electromagnetic radiation given off by all matter. This had led to the invention of the Swift spectroscope and the force-ray repelatron used in Tom's latest spaceship.

The new camera also made use of certain detector features invented by Mr. Swift and used in Tom's "Eye-Spy" camera which could take motion pictures through a wall or other solid object.

The retroscope is described as being in three parts; the camera, an "electronic brain" and a reproducing unit consisting of a cathode ray tube and a photographic output system.

This is how Tom explains the operation of the camera:

"It looks complicated, but the basic principle is fairly simple," Tom said. "As you know, any rock may undergo radioactive aging as its natural elements break down and become other elements. That happens all through the rock. But the layers nearer the surface are more exposed to cosmic radiation from the outside."

"Your dad said that you're interested in studying some rock carvings," put in Jack. "A carved surface means that different layers of rock are exposed all at one time."



"Exactly," said Tom. "For instance, if you carve a gouge in the rock, the cosmic radiation would penetrate deeper at that point than it would in an uncarved part of the rock. Therefore, the radioactivity inside the rock follows the same in-and-out depth pattern as the carving on the rock's surface."

"Wait a minute!" Dick snapped his fingers. "I think I get it. By measuring the radioactivity all through the rock, you can figure out what the carving looked like before it was worn away!"

"Right," Tom said. "Now my camera here has two detectors. One scans the whole surface of the rock to probe out differences in radioactivity; the other stays focused on one unworn spot on the rock surface to show the basic level of the rock's radioactive aging."

Tom has to redesign his camera when he finds that the pictures are unclear due to external radiation, such as cosmic rays. Eventually he uses some radiation screening devices in conjunction with the electronic brain to cancel out the radiation. The books explains it like this:

Actually two fields would be necessary, he soon realized - one above the camera detectors and one

below. Any radiation that passed through both fields would automatically "identify itself" as coming from the upper atmosphere. The electronic brain could be "ordered" to throw out such radiation.

On the other hand, all radiation coming from the object being photographed would pass between the two fields. The brain would use only this radiation in making its computations and thus produce a clear picture without interference.

Would the Retroscope work? As I understand it from the book, the retroscope works by bombarding an object with radiation then measuring the radiation that comes back from each point of the object against the average level inside. The average level of radiation inside the object is assumed to be purely the result of natural radioactive decay (all rocks contain a small amount of radioactive isotopes that slowly decay into other elements).

Cosmic radiation would cause changes in the object's composition at a constant level under the original carving. The retroscope would measure this against the background radiation of the object to determine the original appearance.

The feasibility of this invention rests on whether cosmic rays change a material that they hit. Cosmic rays are high-energy particles from space that constantly bombard the earth from every direction. About 87% of cosmic rays are protons and about 12% are alpha particles. These types of particles should change an object that they hit in some way. The difficulty is measuring this, but I believe the invention could be made to work.

This invention reminds me of carbon dating, but it is non-destructive and works for inorganic objects.

The statement about the retroscope using the discovery of the previously unknown form of electromagnetic radiation used for the repelatron seems to be at odds with the explanations elsewhere in the book, unless the radiation is used in the scanning process.

It is interesting that Tom uses an electronic brain to process the information. This is described in other books as a programmable analog computer. This would be the best way to manage the detailed calculations needed to reconstruct the original appearance of an object from a three-dimensional scan. The benefit of an analog computer over the digital computers of the day was in their compactness and high speed.

What impact would the retroscope have on our lives? I believe that the retroscope would be useful for archeological work and would have very limited application in other areas.

The Paraplane

The **paraplane** is the other significant invention in this book.

How does the paraplane work? The paraplane is a small jet aircraft that also has a dirigible bag that can be used to provide buoyancy when the jet motor is not used. Here is a description from the book that explains the principle of the paraplane:

The plane was part jet plane and part dirigible. After the dirigible's bag was filled with helium, so the plane could float without power, the bag could then be slowly deflated to bring the ship gently to earth.

The paraplane is stored on board the Flying Lab with its wings folded into the fuselage. The wings deploy shortly after it is launched. Although it is small, it has enough cabin space to accommodate Tom, Bud and Chow on its first flight in Mexico and later in the book it carries Tom and three police officers.

The dirigible bag is only filled with helium when needed, as the idea is that it is for emergency use or for take-off and landing in tight spots. This is how Tom explains the operation to Chow in the test flight:

"How we goin' to float down in this contraption"? Chow eyed the strange-looking craft uneasily. "I thought it was s'posed to have some kind o' balloon or somethin'."

"It has," Tom replied, "but the dirigible bag is deflated now and stowed inside this pod." He pointed to a domelike bulge on top of the fuselage. "We'll blow it up with helium as soon as we're air-borne."

To descend to earth, the process is reversed. This is how the book explains it:

The helium tanks were mounted in a small compartment at the rear of the cabin. Tom switched on an electric pump and compressor to suck the helium back into the tanks. A humming sound filled the plane as the bag deflated. Gently the paraplane descended towards the treetops.

Would the paraplane work? The paraplane could work, but there are some practical issues to work out before it could work as described.

The book doesn't give any indication of how big the dirigible is but a fairly large dirigible would be needed to provide adequate lifting force to overcome the weight of an aircraft and its passengers, even a small, light one like the paraplane. Even if the paraplane was extremely light, the weight of four passengers on board would represent at least 350 kg. Also, there is the weight of the helium tanks, compressor and fuel to take into account although the dirigible envelope itself would be fairly light.

Goodyear developed a heavy lifting balloon for logging and this comprised two balloons, each 110 feet long and 28 feet in diameter, with 75,000 cubic feet of helium. This could lift several tons. A balloon to lift cargo from Navy ships had a capacity of 530,000 cubic feet. Whilst the paraplane dirigible wouldn't need to lift anywhere near this weight, it gives an idea of the size of the dirigible envelope required to lift a substantial weight. Also a large volume of helium would have to be stored in the tanks, meaning that the tanks would be large and heavy.

The dirigible's envelope could be easily stored as described in the book. In fact, the Echo series of balloon space satellites were stored ready for deployment in a 26-inch diameter container and opened up to be 100 feet in diameter.

Also, the mid-air inflation would be possible and this has actually been done in a technique developed by the U.S. National Bureau of Standards, Boulder, Colorado. The technique does not use pressurized helium as with Tom's paraplane. The helium is stored as a liquid (which is more compact) and converted to gas with a special heater. Mid air inflation takes about 5 minutes and the platform is launched from an airplane and supported by a parachute whilst inflating.

I do have some doubts about a small electric compressor being able to deflate the balloon. I think that a compressor that could deflate a large balloon and put the helium back into high pressure tanks would need a lot of energy, and it would not be a quick process as with the paraplane.

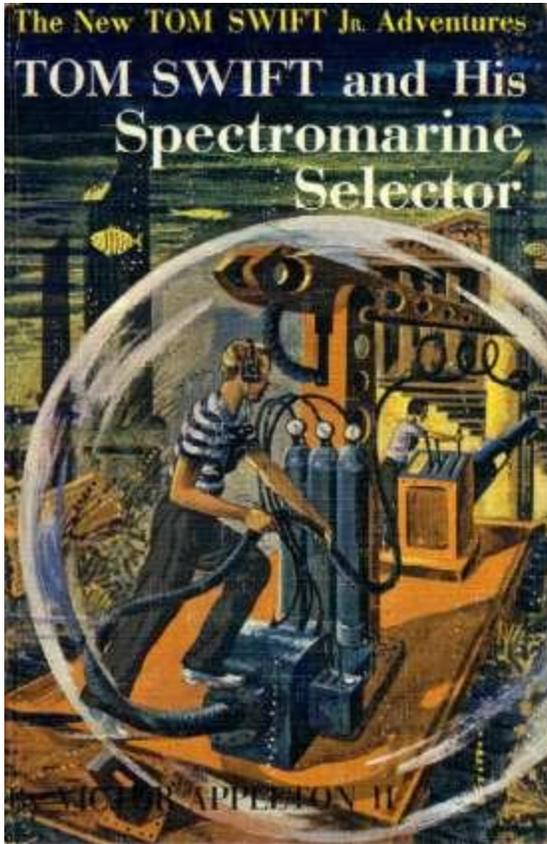
What impact would a paraplane have on our lives? A paraplane would offer a number of benefits. It would be able to take off or land in very confined spaces with the help of the dirigible. Virtually any open space could serve as an airfield, without the need to build expensive runways.

Also in an emergency, the dirigible could provide a soft landing, saving lives.

Recently work has been done on parachutes that can provide a soft landing for light aircraft, but unfortunately these are not yet widely used.

Until the practical issues associated with the paraplane idea are sorted out, it is unlikely that we will see one in operation.

#15. Tom Swift and his Spectromarine Selector (1960)



First, let me say that the scan of the cover of this book was sent to me by Greg Weir, and the summary was sent to me by Bill McAndrew. Thanks a lot!

Summary: Extracted from the front flap of the dustjacket:

"We're trapped a mile below the ocean's surface," Tom Swift announces to his companions as calmly as possible. His father and Bud Barclay exchange fearful glances in the air-bubble elevator stopped in its undersea descent by a jammed cable.

This close call is only one of the many hazards which beset Tom on his most challenging deep-sea venture - a trip to the ancient city of gold on the ocean bottom.

Here, with his pal Bud Barclay and other members of the Swift expedition, Tom tests his two new inventions. With the de-organic-izer, which employs revolutionary scientific principles, crusts of centuries-old sea growth are removed from the city's buildings and the original gold luster restored. With his other astounding invention - the spectromarine selector - Tom searches for a valuable new rare metal. He must succeed, if his father is to fill an important government

rocket contract.

A terrifying sea monster, an abandoned submarine containing human skeletons, a near-fatal leak in the hydrodome over the scene of operations, and the unexpected appearance of an enemy fail to daunt Tom in his mammoth undertakings.

How the young scientist-inventor achieves his goals is told dramatically in this thrill-packed story of undersea adventure.

Before I Begin: A Word on the Cover

Before I get into a summary of the book, I think that a few words should be said about the pictures used in this book. The art in this book, basically, is horrible. Every single picture depicting an underwater scene is wrong.

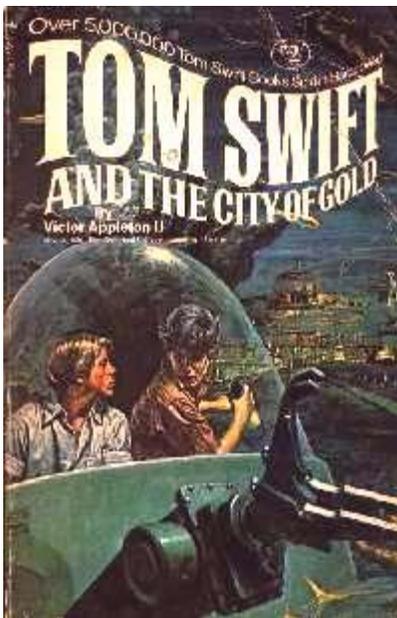
Take, for example, the cover scan. The picture shows an air bubble that just barely encases the Spectromarine Selector. This is completely wrong -- the book was quite clear on the fact that the air bubble enclosed the *entire* city. More than that, however, the air bubble was enclosed with a plastic dome made out of Tomasite -- and that dome appears nowhere on the cover.

Besides that, however, just what is Tom Swift doing wearing a set of headphones? The only person to talk with is the guy working the levers, and if you'll look closely you'll see that he isn't wearing any headphones. But even if he was, what was to stop them from just talking to each other? From what I could gather the machine made very little noise -- Tom carried out normal conversations with people all the time while running his Spectromarine Selector.

And are we really suppose to believe that that is what the machine looked like? Surely there's more to it than that! But even if there isn't, why in the world would Tom have wasted all of that space? The machine could have been made far, far smaller than it is depicted. And what are those fish doing on the cover? One of the side-plots of the book involved Tom trying to figure out why sea life *avoided* Aurum City.

Other pictures in the book are equally flawed, but I think that you get my point. Really, Grosset and Dunlap should have tried harder to get better cover art...

The Spectromarine Selector



In the book *Tom Swift and his Diving Seacooper* Tom Swift discovered a vast underwater city, apparently made of solid gold. At the time of the city's discovery, Tom Swift did nothing more than note the city's position, because there was really very little he could do. If this doesn't make sense, think about it for a moment: how does one take possession of a city located *13,000 feet* beneath the ocean's surface? The tremendous pressure at that depth taxes the strength of the world's strongest submarines; doing any kind of restoration work or establishing any sort of permanent colony at the site of the ruins was just out of the question.

As the months rolled by, however, Tom found ways of dealing with the immense challenges that prevented him from taking possession of the underwater city. First, as related in the book *Tom Swift and His Deep-Sea Hydrodome*, Tom found a way to create a city of his own miles beneath the ocean's surface. Later, Tom Swift developed a speedy way to clean the grime off of centuries-old objects. Armed with these two inventions, Tom Swift went on to restore what he called Aurum City (and I'll get to the details on Aurum City in a minute).

The machine that Tom developed to clean the grime off of his splendid underwater city was (somewhat unromantically) called the **Spectromarine Selector**. The *Spectromarine Selector* (or, as Chow nicknamed it, the organ) is kind of like a souped-up vacuum cleaner: you point this machine at what you want to be cleaned, and poof! it becomes clean. Silver, as Tom Swift demonstrated, can be polished in seconds. An

entire swimming pool can be made devoid of algae in mere minutes. Statues, buildings, you name it -- if it's got dirt or grime, the *Spectromarine Selector* can remove it and make the object look as good as new.

Want to hear more about this odd device? Read on...

What were the nicknames of the Spectromarine Selector? The Spectromarine Selector has three names. Its official name, from what I can tell, is the Spectromarine Selector. Tom Swift, however, almost always referred to it as a de-organic-izer. Others, however, usually referred to it simply as the 'organ'.

How did it get its nickname of 'organ'? Well, it happened like this:

Beaming, Chow hoisted his rotund bulk up onto the operator's platform. His eyes bulged admiringly as he watched Tom's fingers move about the control board, adjusting various dials.

"Brand my biscuits, boss," Chow murmured, "you kin play this lil ole contraption like it was a pipe organ!"

Tom grinned without speaking. But the onlookers picked up the leathery Texan's remark and began needling him jokingly.

As the cook blushed, Bud followed up with an off-key rendition of "When the Organ Played at Twilight."

Brian grinned and remarked, "Tom, I think your invention had just been officially nicknamed."

How does the Spectromarine selector work? The Spectromarine Selector, despite its long name, is actually a very simple invention that works on a simple, well-known principle: water will boil at very low temperatures in a vacuum. Don't see the connection between that principle and cleaning objects? Well, let me explain.

First, the Spectromarine Selector, via a mind-boggling device called a **Localator Vacuum Producer**, creates a vacuum in the vicinity of the object. This vacuum drastically lowers the boiling point of the water that is inside the vacuum -- in fact, it lowers the boiling point so low that any water that is in the slime on the object can be "boiled" away without damaging the object that is to be cleaned.

Once the vacuum is in place, then, the object is heated by high-intensity light waves until the water starts to boil. Once the water is boiling, it boils the impurities and slime right off the object that is being cleaned. The steam and garbage that is cleaned off of the object is sucked back into the Spectromarine Selector and is recombined into a number of useful products -- including fuel that can be used to help power the Spectromarine Selector.

What problems did Tom have to overcome in inventing his Spectromarine Selector? As one might expect, early versions of the ultimate cleaning device are bound to have a disastrous bugs in it, and the Spectromarine Selector was no exception. The first bug Tom had to fix was the Spectromarine Selector's habit of "eating" the object it was supposed to clean:

"This little model actually works?" Phyl asked in amazement.

"Sure," Tom turned to Bud with a grin. "Like a little hair off the top, pal?"



"Please! Don't experiment on me, Professor!"

Phyl held up her leather purse with silver initials. "These need shining," she said playfully. "Could your machine remove the tarnish?"

"No sooner said than done, madame!"

Tom aimed the organ at the metal initials. Then he flicked on the power, provided by a miniature solar battery, and turned a dial.

Phyl and Sandy gasped as the tarnish disappeared like magic. But their amazement quickly turned to dismay as the initials too began to vanish. Before Tom could turn off the machine, even the leather was partly eaten away!

"It's ruined!" Sandy groaned.

Tom, red-faced, hastily apologized.

"Don't worry," Phyl said good-naturedly. "It was an old purse, anyhow. But what happened?"

Tom explained that he had adjusted the machine to remove tarnish, a sulfide compound. But the selector circuit, by a feedback action, had also ordered the machine to remove the metal.

"There's sulfur in the leather, too," he added. "So the organ took part of *that* off!"

"Just a slight slip-up." Bud grinned.

"A slip-up that could cause plenty of damage," Tom admitted ruefully. "I'll buy you a new purse, Phyl, and let's say this one went for the cause of science. At least it showed me a flaw in my machine that needs correcting!"

Tom solved this problem by inventing a little add-on that would fine-tune the Spectromarine Selector's sensing abilities:

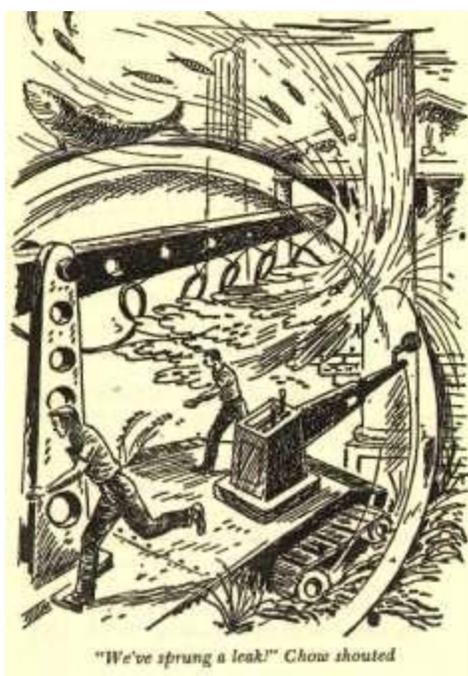
Tom explained the flaw that had spoiled his demonstration on Phyl's purse. "I think I have the answer," he added.

Pulling out pencil and paper, Tom sketched a feedback-control circuit which he had worked out in his mind overnight. Its purpose was to prevent the compounds in the object being cleaned from affecting the selection of the elements to be removed.

"Pretty slick," Art commented. "And we can add that easily before the unit's assembled."

The second problem Tom had to grapple with was the Spectromarine Selector's bad habit of producing extremely deadly cyanide gas:

"Tom, where did that cyanogen come from?"



"I don't know for sure yet," Tom admitted. "But I have a hunch it may have been formed by the action of the organ."

As soon as the atmosphere was purified, Tom checked the device. His suspicions seemed to be borne out after careful testing.

"The S-Co was releasing carbon and nitrogen too fast," Tom explained to Bud. "They combined to form the cynaogen gas."

Solving this problem was simply a matter of combining the cyanide gas with other gases to form harmless elements:

"I'll simply alter the storage system so that the hydrogen and nitrogen from the organic waste can be combined to form fuel gas," he told himself. "The carbon can be combined with oxygen to form carbon dioxide and pumped off into the ocean!"

How well did the spectromarine selector work? The Spectromarine Selector worked *very* well, as the following passage demonstrates:

With his checkout completed, Tom started the traction motor. The organ rolled forward on its caterpillar treads until Tom brought it to rest, facing a group of statues. They stood in a row before a lofty porticoed building.

"Suppose we see what these statues look like underneath all that gunk," Tom said.

Switching on the infrared unit, he moved a level which started the localator vacuum producer. He aimed the intake at the nearest statue and instantly it began to whisk of the slimy coating.

"Like a giant razor in action," Bud remarked.

Tom grinned, as he fingered the S-Co controls which changed the molecules of the organic waste into easily stored compounds.

The watchers gasped as the slimy statue was gradually transformed into a glittering gold animal god! The human face had a hawk's beak and folded wings on a catlike body. As Tom proceeded, other statues turned out to be crouching lions of jaguars with men's features. One depicted a huge serpent coiled around a goddess.

"They're solid gold!" Fraser gasped.

"They may have just a golden shell over some other material," Tom said cautiously, after getting out of the cab to examine the statues more closely.

At first the machine suffered from one problem: it didn't work very fast. Tom fixed this problem by inventing a molecular catalyst that doubled the cleaning speed of the Spectromarine Selector. No details on this catalyst were given, but it seemed to work very well; once it was in place, Tom Swift didn't do anything else to speed up or enhance his machine.

How feasible is it to build a Spectromarine Selector? The Spectromarine Selector, as a whole, is not a difficult device to build. Many of its parts -- especially the part that recombines various molecules to form various substances -- are relatively easy to construct.

Unfortunately, however, the Spectromarine Selector does one thing that, in real life, is impossible to do: it, via a device called a **Localator Vacuum Producer**, can create a vacuum around a distant object. This Localator Vacuum Producer works incredibly well -- it works so well, in fact, that it enabled the Spectromarine Selector to change the molecular structure of the Tomasite dome covering Aurum City, despite the fact that the dome was dozens of yards away from the machine!



But how in the world could it create on-the-spot vacuums? The only way that I know of to create a vacuum is to use some kind of pump to pump the air out. The Spectromarine Selector, however, obviously doesn't do that -- if it did, there's *no way* it could have affected the dome covering Aurum City. This vacuum issue is a key point, since the whole invention hangs on the behavior of water in a vacuum. Without the vacuum, that the device simply would not work.

However, that's not to say that a Spectromarine Selector-type invention is impossible. Such a device actually does exist! In the August 1998 issue of *Mechanical Engineering*, there is an article covering a French-built machine called the Lama. (The word Lama, by the way, is short for *Laser Manuportable*

Por Le Nettoyage des Facades et des Monuments Historique, which roughly translates into "portable laser for cleaning historic monuments").

The Lama sounds very similar to the Spectromarine Selector. According to the article, the Lama basically works by vaporizing the dirt with a low-intensity laser beam:

The light energy, a maximum of 500 millijoules, delivered by the laser beam to the handpiece, is absorbed by the generally dark-colored stains on the stone being treated. This vaporizes the stains into a rapidly expanding plasma. The resulting shock wave removes the remainder of the stain by mechanical action.

Engineers designed the Lama to produce very short-duration laser pulses of eight nanoseconds, which prevents the heat of the laser from diffusing into the substrate and damaging it....

The Lama system, like the Spectromarine Selector, can clean a variety of surfaces and deal with different kinds of dirt. Moreover, once the dirt is gone, the laser doesn't damage the object it's cleaning. How does it do this? Well, read on...

The Lama system has a double threshold that varies, depending on the composition of the stains and the material to be cleaned, as well as its ability to absorb the laser light. Below a lower level of energy intensity, the laser light does not have a cleaning effect on the stains, while above an upper intensity threshold it can cause the surface to deteriorate. In the "working window" between these thresholds, the laser's effects are self-limited; once the stain is destroyed, the continuing laser pulses do not damage the material's surface, thus leaving the protective patina undamaged after cleaning.

It looks like, as far as the Spectromarine Selector goes, modern science has finally caught up with Tom Swift.

How much impact would a Spectromarine Selector have on civilization? The Spectromarine Selector would probably find some pretty important market applications. Tom Swift himself realized this, stating that:

"...if my invention works, I'll have them made in small sizes for commercial use. They'd be great for cleaning and sterilizing food, soil, buildings and monuments, or what-have-you. And think how handy they'd be for cleaning up after floods!"

I think that he's right. There is great demand for a universal cleaning machine -- especially for one that could enormously speed up cleaning up the aftermath of floods, fires, and hurricanes. Today, for the most part, cleaning is done either by hand (which is a *lot* of work) or with the aid of expensive and somewhat dangerous chemicals. Having a simple, cheap, mechanical means of cleaning *anything* would definitely find a huge market.

Take, for example, the swimming pool industry. Anybody who has ever had to clean the bottom of a swimming pool after mismanaging its chlorine levels would probably jump at the chance to buy a simple, little machine that could completely clean a swimming pool within minutes. If the Spectromarine Selector were sold in hand-sized units, I'm sure that before long every swimming pool owner would have one. (Thanks to Jeff Duntemann for pointing this out to me!)

But, hey, cleaning swimming pools isn't all that a hand-sized spectromarine selector is good for. These things would be great for cleaning statues, streets, buildings, bathrooms, silver, dishes, you name it -- if it

needs to be cleaned, this thing can clean it. I imagine that an adapted version could even be used in a washing machine.

Would it fundamentally change life as we know it? Probably not -- after all, it's basically only a new kind of cleaner. Still, I imagine that it would find a pretty large market.

Aurum City

Tom Swift, in the course of the Tom Swift Jr. series, built two underwater cities. The first underwater city was built to tap a massive underwater helium well that Tom had stumbled across. Because the only way to tap the helium would be to establish an extensive mining base, Tom Swift had to find a way to build a large city 13,000 feet beneath the ocean's surface.

Tom overcame the problems of building an undersea city by inventing a fantastic device called a *repelatron* that could repel water. Equipped with this device and a complex atmospheric system, Tom Swift established his first undersea city, which he called his Helium City.

Soon after building his Helium City, Tom applied all of the knowledge he had gained to building another underwater city one. Many months earlier, Tom Swift had stumbled across a large underwater city apparently built of solid gold. At the time of the discovery Tom Swift had no way of salvaging any of the city, so he left it alone.

Once he had invented his repelatron, however, Tom Swift had a idea: why not establish a series of Hydrodomes over the city of gold, clean up the city, and open it up to the public? Armed with his Hydrodome and his Spectromarine Selector, Tom Swift did just that, as this volume relates.

What are the details of his second underwater city? Read on...

How did the city get its name? When the book opens, the underwater city Tom planned to construct didn't have a name. Tom's copilot Bud thought that it should have one, so he suggested one to Tom, as this passage reveals:

"Tom, the ancient underwater layout will need a name, especially after you get things shined up for tourists. How about Aurum City?"

"Aurum City?" put in Chow, who had come forward to see if anyone was hungry. "Where in tarnation did you get that handle?"

"*Aurum* means 'gold,'" Bud explained. "One of the six words I remember from high school Latin," he added with a grin.

"Aurum City," the old Westerner repeated musingly, rolling the name over his tongue. "Hmmm. Not bad, Buddy boy. I kind o'like it."

Tom agreed. "Aurum City it is."

Where is the city located? As one might imagine, the exact location of the sunken city is not given. However:

"I understand this sunken city is somewhere near the Cape Verde Islands," put in Lieutenant Cromwell.

How did Tom plan to restore the city? Restoring a city located thousands of feet underwater is an enormous challenge, and the book goes into some detail as to how it was done. There are far too many details to be related here; however, the basic plan can be summed up as follows:

"What's your plan of operation?"

Tom explained that he would create a giant air bubble around the site by means of his force-ray repelatron. He had used the same method in tapping a fabulous undersea bed of helium gas. This tremendous bubble of air, with its ceiling and walls of plastic, had become known as Tom Swift's deep-sea hydrodome.

"The hydrodome will provide a safe working space underwater," Tom continued. "Then I'll use my new de-organic-izer to--[clean the ruins.]"

What civilization did the ruins belong to? Good question -- I wish I knew! Tom was of the opinion that the ruins belonged to Atlantis, and that his space friends played some kind of role in the building of the city. The clues -- both in this volume and in others -- are tantalizing. In fact, there are so many clues and references that it seems hard to believe that the story stops here. At one time, another volume *must* have been planned that involved Tom Swift discovering the secret of the underwater spaceship, solving the riddle of the ruins, and maybe even meeting his space friends. However, that other book never materialized. Hopefully, one day, that missing volume will be written and will finally put all of these questions to rest...

As I said, Tom thought that the ruins belonged to Atlantis:

"This may be one of the greatest archaeological finds in history," Bud remarked.

"But where did it come from? I mean--what civilization *was* this?" the lieutenant asked.

"We think it *may* be the lost Atlantis," Tom replied, "but I'm hoping this expedition may turn up some clues that will give us the answer." He went on to explain the legend

deciphered by the two government oceanographers who had first helped him locate the sunken city.

These two men had discovered an ancient Peruvian inscription about the original Incas of South America. It told how they had come over the sea from a far-off land which had been engulfed by a terrible earthquake and flood.

"The data given in the inscription pointed to this very spot," Tom ended. "It was also near some peaks shaped like man-made pyramids which I had already spotted in the Atlantic Ridge. But it'll take a lot of work yet, Brian, to piece together an accurate explanation."

...

Aurum City had been built in a canyon enclosed by beetling rock walls. These parted into a great valley beyond the city's outskirts.

The *Sea Hound's* beam swept the valley floor as they glided along. Here and there stood crumbling stone huts, overgrown with seaweed and ocean vegetation.

"Wonder who lived here?" Brian mused.

"Probably these were peasant apartment houses," Tom deducted. "In fact, this whole area may once have been a green, verdant valley with flocks of livestock and cultivated fields."

"Just think," Tom went on. "An unknown people settled this valley thousands of years ago. They grew skilled enough in art and architecture to build splendid gold palaces and temples. They must have had good farmers, too, to feed the population. Then one day disaster struck--a flood wiping out the work of centuries. And the whole land sank under the ocean!"

As for what the people might have looked like, Tom was of the opinion that they were a mixture of Oriental and South Sea:

"What type of people could have made them [statues], skipper?" Doc Simpson put in with keen scientific curiosity.

"They look like something like those Mayan statues we saw in Yucatan, don't they?" Bud said.

Tom nodded thoughtfully. "Their form is similar. Bud I'd say their faces are more like a mixture of the Oriental and South Sea sculptures on display in our Shopton Museum."

More specifically, however, Tom thought that his space friends also had a hand in the construction of the ruins:

Bud was thoughtful. "Remember those carvings we spotted on one pyramid during our last trip here?" he remarked to Tom presently.

Tom nodded. "They were pretty well faded and covered over with sea growth. But I'd sure like to know what they mean!"

"Same here!"

Tom fell silent a moment, then went on, "You know, But, it's strange that we haven't found other carvings right in Aurum City. Almost every civilization leaves some kind of markings on its public buildings."

Bud's eyes kindled with interest. "Wow! You mean those carvings on the pyramid may have been made by someone else?"

"Just a hunch." Tom smiled. "You're probably thinking the same thing I am. Those carvings did look a bit like space symbols!"

...

"But how in the world could such creatures have made markings on those pyramids, even before they sank under the ocean?" Brian asked.

"We know they made at least one voyage to Earth centuries ago," Tom replied. "We found their symbols carved on some Mayan ruins in Mexico, telling how their spaceship had crashed. They might have left marks on these Aurum pyramids on some earlier voyage."

Tom added that he hoped to bring his electronic retroscope to Aurum City some time later and try to bring the faded carving into sharper focus.

Tom's opinion that his space friends were involved was pretty much confirmed with the following discovery:

Half buried in the ocean slime below the promontory lay a strange craft. It resembled the sky wheel which Tom Swift had built as his first Outpost in Space!

"A spaceship!" Bud gasped.

What problems did Tom Swift have to overcome in restoring Aurum City? When you build anything as large as a city you are bound to run into problems, and Tom's construction of Aurum city was no exception. Tom Swift ran into a number of hair-raising problems, but, as one would expect, he managed to solve them all. What were those problems?

Tom Swift had a chance to catch the first problem before it happened. However, he couldn't figure out the mystery of the missing wildlife:

"What's going on in that supersonic brain of yours, genius boy?" he asked with a grin.

"A scientific puzzler, Bud," the young inventor replied. "Have you two noticed the absence of sea life on the floor of this city? Of course there's plenty of undersea vegetation," he added, "but no *animal* forms of marine life."

"That's so," Brian Fraser agreed. "But aren't your repelatron force waves pushing out the fish and other sea creatures?"

Tom shook his head. "No, the machine's turned only to repel sea water. It would have not more effect on fish than it does on us."

"What's the answer then, Professor?" Bud asked.

Tom shrugged. "I can only guess. But maybe there's something here in Aurum City which is poisonous or obnoxious to animal life."

"Meaning us?" Bud asked.

"Not necessarily. Relax, pal!" Tom grinned and patted his friend's arm. "It may be simply that these buildings are giving off a radiation of low intensity."

"What type of radiation?" Brian asked.

"Some form that's invisible to human eyes," Tom replied, "and as harmless to us as sunlight, yet repulsive to marine animals."

"Interesting theory," Brian conceded. "Can you test it?"

Tom mulled over the problem. "Let's try turning off the lights," he suggested. "If there *is* any radiation present, it may show up as a faint luminescence."

Bud passed the word among the crewmen and Tom walked over to the solar-battery switch box controlling the searchlights. He opened the switch. Instantly the undersea city was plunged into total darkness.

"No glow so far as I can see," Lieutenant Fraser remarked.

Tom sighed. "We can scratch *that* theory, I guess."

This had consequences. It turned out that Tom Swift was right -- the plants were radioactive. It seems that the alloy that the ancient people used to build the city had the radioactive element thorium in it. This thorium somehow entered the cellular makeup of the plants, and when people came into contact with the plants it resulted in a fierce, burning rash that was apparently incurable.

Tom Swift, with a dubious stroke of ingenuity, had an idea: since the Spectromarine Selector can remove the plant from buildings, why not see if it can remove the plant from skin? Tom tried it, and surpassingly, it worked. After cleaning the rash off of all of the men, Tom Swift ordered that gloves be worn to prevent further outbreaks.

Another problem Tom Swift had was in the repelatron. It seems that, when this book was written, the repelatron was not yet a perfected invention; to keep it working right it needed to be watched over every minute. The people he set over the repelatron, however, were not reliable; one of them goofed off, and as a result everyone came close to being squashed under thousands of feet of water.

How was this problem solved? Simply by adding another man to watch the repelatron, and bringing in a backup repelatron in case something went wrong with the first one.

Another problem Tom had had to do with one man's carelessness:

As Mel swung the machine around, Tom suddenly noticed that someone had left the entrance flap to the plastic dome open.

"Hey!" he called out to a crewman. "Zip up the--"

His warning was too late! The intake tube of the organ pointed straight toward the dome opening!

There was a startling *whoosh* as the powerful suction machine drew in a torrent of sea water. Queer-looking fish and sea creatures came hurtling into the dome!

Pop!...Pop!...Pop!

They exploded right and left under the sudden release from the deep-ocean pressure! One--an enormous octopus--sent a shower of inky black fluid shooting in all directions!

Cleaning up the mess took a good while, and it taught Tom a lesson in carefulness.



Yet another problem Tom Swift had had to do with a flaw in his Spectromarine Selector:

A long fracture showed in the plastic dome! As they gaped, another crack appeared with a loud report. An instant later a chunk of plastic broke off and came clattering down, narrowly missing a crewman.

"Good grief! The dome's breaking up!" Bud gasped.

Tom was horrified. The enclosure was needed to maintain a stable atmosphere--without it, the osmotic air conditioner would no longer function properly! The atmosphere inside the air bubble would become unbearably humid!

"What's causing the breakup, Tom?" Bud cried, as shouts of alarm rose from all sides. More cracks appeared and another fragment broke off.

"Must be the organ!" Tom guessed, sizing up the situation fast. Breaking into a run, Tom dashed toward Mel Flagler's work crew. He cupped his hands and shouted. "Turn off the de-organic-izer!"

His words were drowned in a sudden fusillade of noise overhead. The dome, weakened by the cracks, was caving in completely! Whole sheets and chunks of the plastic ceiling came raining down in a deadly barrage as the yelling crewmen flattened themselves or ducked for cover.

The breakup continued for several moments. When Tom finally dared raise his head, he saw that little was left of the dome except the slender, shiny framework of magnesium struts.

What caused it? Read on:

"I still can't figure it out," Bud said, walking up to Tom with a puzzled air. "Why should the organ made the dome go to pieces?"

Tom picked up several of the plastic fragments and examined them. "This stuff's gone brittle as glass," he muttered. "Apparently the S-Co unit caused a chemical change in the plastic wherever the intake was carelessly aimed toward the dome. Once an internal strain was set up in the material, it was just a question of time before the whole dome cracked up.

"Oh, fine!" Bud said gloomily. "Does that mean we can't ever use the organ inside an air dome?"

"Depends on whether or not I can correct it," Tom replied. "We'd better stop work, anyhow, till we get a new dome."

After adjusting the air conditioner to compensate as much as possible for the changed conditions, Tom partly disassembled his spectromarine selector. He had the electronic controls of the S-Co unit moved into his laboratory.

How did he solve it?

The problem was not too difficult. The young inventor had already analyzed a piece of the broken plastic under his spectroscope to determine the exact chemical change that had taken place. The selector circuit of the S-Co would need an automatic control to prevent it from acting on any substance having the same carbon-hydrogen-oxygen ratio as Tomasite.

The tedious work would come in the actual rewiring of the electronic assembly. By midnight Tom finished the job and with a yawn turned in.

"Success?" Bud asked the next morning as Tom opened his eyes.

His chum nodded and soon the two were installing the alerted S-Co unit in the organ.

What plans did Tom Swift have for his Aurum City? Tom Swift's plans for the city were simple: he would enclose it with a hydrodome, clean up the city, turn it over to the United States Government, and open it up for tourists and scholars. After some trouble with air domes, Brungarians, and the like, Tom Swift did just what he had planned.

Atomeron

In the beginning of this book the United States government awards Tom Swift Sr. a contract to build a number of rockets. Tom Sr., however, had a problem: he couldn't get his hands on enough of the right alloy to fulfill the contract. Bud, somewhat jokingly, told him that what he needed was to come up with a rocket-age metal, which Bud said could be called *Atomeron*.

The job of discovering this new alloy naturally fell to Tom Swift Jr., and he did a splendid job of it. He did such a fantastic job, in fact, that Tom Sr. said that he could actually better the rocket contract deadline.

Want to find out the details on the properties, discovery and mining of this fantastic metal? Well, then, read on...

What were the terms of the rocket contract, and why was Tom Sr. concerned about meeting them?

We are not told how many rockets were to be built. However, we were told that they were due in six months. Six months, to me, seems like a long time; however, Tom Sr. was very concerned about his ability to meet that deadline. Why was he concerned? Well, read on:

...Mr. Swift shook his head worriedly. "My troubles are just beginning," he told the boys. "The terms call for faster production than I'd anticipated. Frankly, I'm afraid we can't deliver all the rockets on time--in fact, we'll be doing well to turn out half that number!"

"Why not use our facilities at Enterprises?" Tom urged. "Put everyone on the project!"

"It's not manpower," his father explained. "It's a matter of obtaining a prompt supply of the rare metals I need. I hate to fall down on the job when our country needs those rockets so urgently. But I've exhausted every means I know of to get those metals."

With a glum sign, Mr. Swift added, "It look as if the job may have to go to the next lowest bidder."

"What are the rare metals you need, sir?" Bud asked curiously.

"Some of them should be familiar to you, Bud." Mr. Swift smiled. "After all, you and Tom discovered the quarry where they're mined."

"Dad's talking about those so-called rare earths we found in New Guinea," Tom put in. "Remember?"

"Oh sure," Bud recalled. "You mean those metals with the jawbreaking names, like--well, like praseo-something."

Tom grinned. "Praseodymium. Yes, that's one of them, Bud., Anyhow, Dad's been using several of those rare-earth elements to produce the lightweight, high-strength alloy he needs for the air frame of his new rockets."

"Plus a few other rare metals," Mr. Swift added, "including Lunite from the phantom satellite."

The scientist went on to explain that the job of obtaining and combining these metals into a complex alloy had led to many production headaches.

"If only I could find a new metal with the right properties!" Mr. Swift mused wistfully. "Perhaps a metal which I could combine with plain magnesium. That would not only cut down the cost of the rockets but greatly speed up production!"

Bud, of course, had a solution to Tom Sr.'s alloy problems:

"What you need is a real atomic-age jet metal!" Bud quipped. "Let's see. You could call the new alloy 'atom-something.' Atomeron! How about that?"

"Good name." Mr. Swift grinned. "But first I'll have to find the right ingredient."

"Nothing to it, Dad," Tom said jokingly. "Just leave that to Barclay and Swift--Atomic-Age Prospectors, Incorporated!"

"Fine! But make it soon, please. Remember, that whole government contract has to be filled in six months."

Where did Tom find the right alloy? As it turned out, Tom Jr. didn't have any trouble in coming across the right alloy. The underwater city that Tom Swift Jr. had discovered and was in the process of restoring was practically built out of the very alloy Tom Sr. needed:

"Take a look, Bud! This statue isn't solid gold after all!" Tom pointed to the fractured surface of the metal. The piece had an inner core with a strange yellowish sheen. This was overlaid with a shell of gold.

"Tom," said Bud in awe, "I remember your saying the stuff might not be twenty-four-carat when we cleaned off that first building. But what's this metal inside?"

Tom shook his head, puzzled. "An alloy probably. I'll have to analyze it."

Tom Jr. did indeed analyze the metal. The metal proved to be very interesting:

"Ever seen a metal like this before, Dad?"

Mr. Swift examined the sample. A frown creased his brow. Taking out a high-powered, double-lensed pocket magnifier, he studied the surface of fracture.

"Hmmm. This is certainly new to me, Tom. It's an alloy, of course--probably with a gold base, although it seems very lightweight."

"Good guess, Dad." Tom explained that he had had a rough analysis made that morning. "This alloy does contain gold, but also an unusual combination of other elements, including scandium, rubidium, and beryllium."

And was the metal what they were looking for?

When they finished their experiment, Tom Sr. was glowing with enthusiasm. "No question about it," he declared, doffing his lab apron. He began to scour the chemical stains off his hands. "This alloy tops anything I had hoped to find. As a rocket metal, it's even better than our present alloy!"

...

Mr. Swift's face lit up at the news. "Tom, that's more than I dared hope for! Why, with a supply of this alloy, we could easily fulfill our rocket contract!"

Tom Sr., of course, would need a large quantity of this substance to fulfill his rocket contract. Melting down Aurum City was out of the question; however, Tom Jr. had another idea in mind:

Young Tom was already mentally evaluating their chances of locating the metal's source. "In view of those radioactive traces, Dad, I believe the alloy may come from somewhere near our undersea helium wells," he conjectured.

...

"[I propose] that we find out where this alloy came from!" Tom's voice took on a fresh note of excitement. "There's no sign of any mine or quarry near Aurum City, Dad, so both this alloy and the gold must have been bought from a distance. What's to prevent us from finding the source?"

How did Tom plan to mine the metal? Working a mine two miles beneath the ocean's surface is a very difficult task. Tom Jr., however, was an old hand at constructing underwater mines.

For the specific task of mining the substance, Tom Jr. invented something he called a **selectrol filtration pump**:



Mr. Swift agreed. But he shook his head worriedly at the job confronting them. "Even if we find the source," he pointed out, "it will be a stupendous operation to mine at such depths."

Again Tom had a ready answer. "Now with my new selectrol filtration pulp," he said quietly.

Mr. Swift's eyebrows shot up in surprise. "Another new invention, son?"

"Actually I worked it out some time ago," Tom replied. "But I laid it aside when we took on this gold-city project."

The new device, Tom explained, was somewhat like a centrifuge used for spinning off cream from milk. "As you know, Dad," he went on, "when it's spun around, the cream--being the lightest part of the milk--is not thrown to the outside of the whirling mixture, and is drained off separately from the rest of the liquid."

"But this method, of course, works only with liquid mixtures," Mr. Swift remarked, "or suspensions which can be separated into a 'heavy' and a 'light' part, and has no effect on chemical *solutions*. For instance, a centrifuge couldn't remove the dissolved salt from sea water. So how can your invention separate the alloy from the rest of the dissolved ocean matter?"

"By a repelatron radiator at the center of the pump," Tom replied. "This would be tuned to repel only the alloy--in other words, force it to the outside of the sea water which is whirling around the pump casing."

Grabbing a pencil, Tom sketched his device. The spinning pump, or impeller, would be horizontal. A steady flow of sea water would be sucked in at the top and leave through a pipe at the bottom. The desired substance for which the repelatron was tuned--in this case, the alloy--would be piped off into a collection tank at one side.

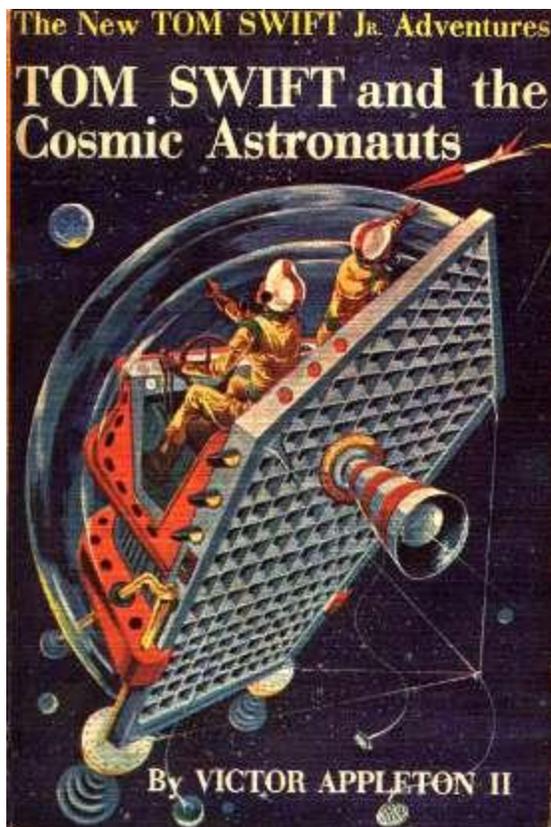
This, Tom continued, formed only the "first stage" of his selectrol pump. There were also two other impeller stages to make sure that none of the desired substance was lost.

How was the mine located? As Tom Sr. pointed out in the book *Tom Swift and his Undersea Search*, finding anything underwater is an enormously difficult task. To enhance his chances of finding the underwater mine, Tom Jr. invented an underwater prospector.

The underwater prospector was basically a platform with a small hydrodome attached. The key part of this underwater prospector was Tom's new selectrol filtration pump, which filtered the Atomeron out of the seawater. When Tom started to get a lot of Atomeron out of the seawater, Tom assumed that they were getting closer to the mine; when the level of Atomeron dropped, Tom assumed that they were getting further away from the mine.

Once Tom found the general area of the mine, he used an enhanced Damonoscope to pinpoint the mine location.

#16. Tom Swift and the Cosmic Astronauts (1960)



Summary: Extracted from the front flap of the dustjacket for this book:

A solution to the prohibitive cost of producing vehicles for further space explorations is Tom Swift Jr.'s new goal. But the success of the young scientist-inventor's project is threatened by the wily Li Ching, a renegade scientist. Banished from his native land because of rebellious acts, Li Ching is now the leader of a ruthless group intent on pirating scientific secrets.

But Li Ching and his nefarious confederates are only partially responsible for Tom's troubles. Olin Whaley, an unscrupulous international criminal, proves to be a second formidable obstacle.

Despite the ever-present threats of sabotage and piracy, Tom and his friend Bud Barclay are soon taking Tom's latest invention, the Space Kite -- a two-man craft for training future space pilots -- on its test flight. The experiment turns into a harrowing experience when the boys are nearly marooned in outer space.

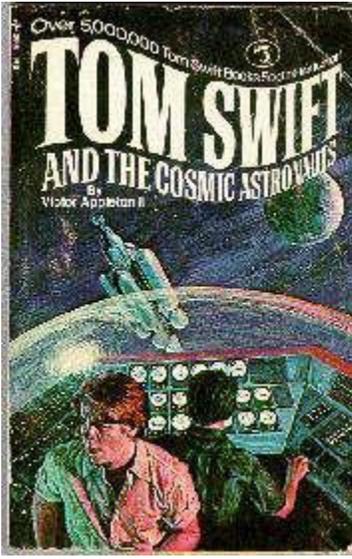
Undaunted by the failure of the Space Kite, Tom quickly discovers the defect and decides to build a larger craft, the Cosmic Sailer. Certain that he has found the key to economical space explorations, the young inventor still has to conquer the sinister forces working against him. How Tom and the Cosmic Astronauts meet this challenge will keep the reader taut with suspense.

Watch for the next spine-tingling adventure of Tom Swift Jr. which will be published soon.

Major Inventions: The Space Kite

(The summary below was written by Graeme Woods. Thanks for volunteering!)

The **space kite** is the most important invention in this book. There are actually two versions of the space kite. The prototype 2 person dome shaped version is shown on the cover, while the final version, christened "Cosmic Sailer", is shaped like an egg and can accommodate 8 astronauts.



How does the Space Kite work? The space kite uses cosmic radiation as a power source. It uses a rocket to launch itself above the atmosphere to where the cosmic radiation is intense enough to provide thrust.

Tom develops the idea of a space kite as a solution to the huge costs of space travel after helping some boys with their kite:

He waved good-bye and resumed his homeward stroll. He found himself wondering if the boys' dreams would ever come true.

"Not if we can't beat the cost factor in space travel!" Tom reflected ruefully. "Kite flying is sure cheaper!"

Kites! The word exploded in Tom's mind. He stopped short as an exciting idea struck him full force. Instead of regarding cosmic rays as a dangerous drawback to space flight, why not make use of them just as a kite makes use of the wind?

"I'll build a brand-new experimental craft on this principle," Tom thought elatedly, "and even call it a space kite!"

But first, Tom realized, he would have to develop a revolutionary device for utilizing the cosmic rays - a sort of cosmic reactor to convert the rays into a usable force. This force would move the spaceship, just as the wind moved the boys' kite aloft.

Later, Tom explained his idea to his father:

"A spaceship propelled by cosmic radiation?" Mr. Swift was at once startled and intrigued. "And yet, why not Tom, I believe you have a really promising idea there."

Then the scientist frowned. "The only trouble is you'd need still another source of energy - something to provide a force for the cosmic radiation to react against. In other words, something to take the place of the kite string on an ordinary air kite. Without such a device, your craft would drift out of control."

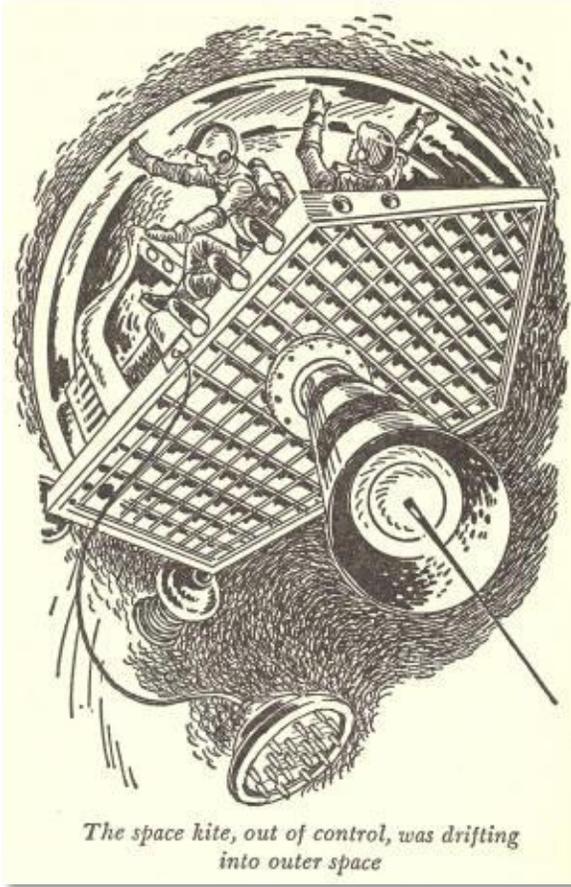
Tom's solution to this problem is a gravity concentrator or gravitex, which is like a repelatron in reverse:

"My gravity concentrator will make use of the attracting force between objects, rather than the repelling force," Tom added.

The gravitex is explained as follows:

Tom reflected that gravity can be considered as a form of radiation even though its nature is not yet clearly understood by scientists.

"But I'm sure that my device will be able to concentrate the strength of radiation by electromagnetic action," he said to himself.



First, Tom shaped the direction cone of his gravitex on a metal spinning lathe. Next, he molded a number of lightweight plastic balls and removed the air inside them with a vacuum pump. He then wound the balls with many turns of fine, insulated silver wire, just as if he were winding up balls of knitting wool.

"Guess I'll call these gravitol spheres," Tim decided, jotting down this name on his working sketch.

The spheres were mounted around the neck of the direction cone, then connected by cable to the electronic component through a power control unit. When power was turned on, the electricity would flow through the fine silver wires and create a rapidly rotating magnetic flux inside the gravitol spheres.

The prototype space kite is described as follows:

The design of the space kite was beautifully simple. The pilot and copilot, with their control board, would be enclosed in the front part by a plain transparent plastic dome. Behind their seats, the

dome was partitioned off by the flat "screen layers" of Tom's cosmic reactor - the device for converting cosmic radiation into motive power.

From the center of the reactor, a cone protruded out behind like a stubby comet's tail. This was to be the directional-aiming cone of the gravitex.

This is how Tom explains the operation of the cosmic reactor to Bud:

"The cosmic rays will enter the screen layer, they pass into the injuster layer, and change velocity in the vacuum layer," Tom began.

At this point, he continued, after the radiation had entered the central part of the machine, flexatrons would absorb the energy of the cosmic rays - thus giving the whole assembly a "push" in the same direction as that in which the rays had first been moving.

"Now notice this smaller housing at one side of the reactor," Tom pointed out.

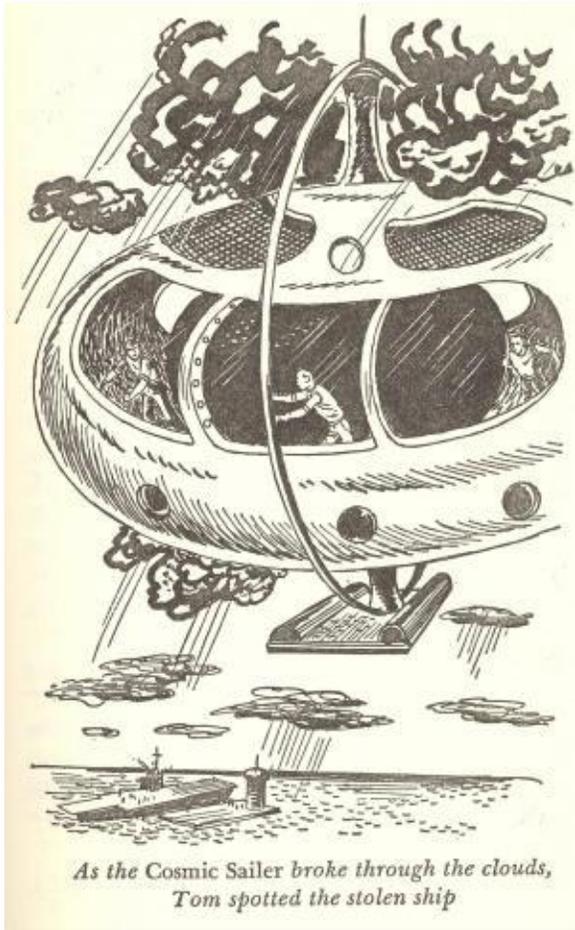
"What's it for?" Bud inquired.

"That will be the direction converter - narrowing into an output vent," Tom replied. "This gadget will bypass the cosmic radiation, so to speak, whenever we don't want any more 'push' on our kite. Or we can use it for 'draining off' part of the radiation when the input is too great."

The prototype version is launched on top of a rocket as high as the ionosphere. However when Tom and Bud encounter a cosmic storm, the craft is blown out of control as the gravitex can't hold it against the surge of cosmic rays. Tom eventually regains control of the craft by operating the direction converter to bypass the extra thrust from the cosmic rays. Since the craft is very small and has limited oxygen and water supplies, they need to be rescued by the Challenger.

After this mishap, Tom decides to redesign the space kite with a "keel" to provide better control. He describes the keel as follows:

"Okay, pal," Tom said. "In flight these radiation emitters will produce an invisible keel of force."



The pilot, he went on, would be able to swivel the ring with its emitters in any direction, on pivoted bearings. Thus he would have a counter-force with which to oppose the cosmic "wind" pressure. Tom explained that this would enable the pilot to "tack" or steer anywhere in space, rather than just drift downwind as the space kite had done.

The new space kite, christened the "Cosmic Sailer" is described as follows:

"I've designed it, Dad, to carry as many as eight persons," Tom explained. "The control cabin will be up front, with another compartment and observation port at the rear, joined by a connecting passageway."

The screen layers, through which cosmic rays were absorbed into the reactor, would be located at the top and on each side of the egg-shaped fuselage. The ring would be mounted upright on a flat, rectangular metal landing deck, with an atomic auxiliary rocket at each of its four corners. These rockets, Tom added, would be used to lift the ship above the earth's atmosphere to an altitude at which cosmic radiation would be strong enough to operate the craft.

The atomic rockets are also used to slow the craft for re-entry and landing.

Gravitex Stabilizers

This invention is an application of the gravitex developed by Tom for the space kite. They are mounted on each side of a boat or ship's hull to stabilise a craft in rough conditions. They are initially installed on the Sunspot, where they keep the ketch upright when it is hit by a sudden gust of wind. Once Tom sees the invention in action, he believes that it would be an ideal product for ships.

Sea Charger

The Sea Charger is a recently constructed experimental ship that was stolen by Li Ching and his henchmen in the beginning of the story. Overall it is a minor invention compared to the space kite.

The book describes the Sea Charger as follows:

The Sea Charger, the Swifts' latest ocean-going experimental ship, had only recently been built and launched. Far surpassing any other scientific craft afloat, it had a fully equipped laboratory, a runway deck for planes, and a unique cable drawn launching pad for space vehicles.

The pictures of the Sea Charger show it to be similar in appearance to an aircraft carrier with the launching pad alongside. The Sea Charger is described as being atomic powered with an atomic pile driving a generator that is similar to many military ships.

This invention is quite technically feasible and nuclear powered aircraft carriers and other large ships use similar technologies, but for military rather than scientific applications.

Would the Space Kite work? The space kite relies on cosmic radiation as a motive force but the book is actually quite vague on how the energy in cosmic rays is converted into force using "flexatrons".

Cosmic rays mainly originate from outside the solar system from sources such as black holes and supernovae, although the sun emits cosmic rays of low energy during solar flares. About 87 percent are protons, while 12 percent are alpha particles, and the remainder are light elements. The average energy density of cosmic rays in our galaxy is about 1 electronvolt of energy per cubic centimetre of space, although particles up to 10¹¹ GeV have been detected.

Since cosmic rays are high velocity charged particles, it should be possible to convert them into electric current. However, I don't believe that it is practical to use cosmic rays to propel spacecraft because the power density is too low. To leave the earth's orbit, a spacecraft must be accelerated to an extremely high velocity, requiring a lot of energy. I don't believe that enough power can be obtained from cosmic rays and converted into motive force to achieve this.

The implication in the book is that the space kite captures cosmic rays in the same way that a sail harnesses the wind. The gravitex and "keel" keep the space kite oriented correctly to the cosmic rays to allow control.

However cosmic rays do not travel in the same direction like the wind does because even a weak magnetic field moves them from a straight-line path. The interstellar magnetic field prevents cosmic rays from coming to earth directly from their point of origin and the directions of arrival are isotropically distributed even for the highest energy particles. This means that the concept of "tacking" or using the cosmic rays like a sail uses the wind is not relevant, although craft have been proposed that use sails to harness the solar wind.

I'm interested in the way the book links electromagnetic and gravitational forces, but I don't believe that the gravitol spheres or the gravitex would work. These are described as generators of electromagnetic flux, which is used to concentrate the strength of gravitational radiation. Motors and transformers are built in a similar fashion, but without any observed effects on gravity. Until a unified field theory clearly links electromagnetic and gravitational forces, we are not likely to see a working gravitex.

Incidentally, the gravitex is similar to the controversial work by Dr Townsend Brown. He discovered the Biefeld-Brown effect, which is the tendency of a capacitor to physically move towards its positive side when charged. He postulated that this was in fact evidence of a link between electromagnetic and gravitational forces. The jury is still out on his conclusion, although the effect is readily reproducible in a laboratory.

In summary, I don't believe that the space kite could work as described although it is an interesting and original idea.

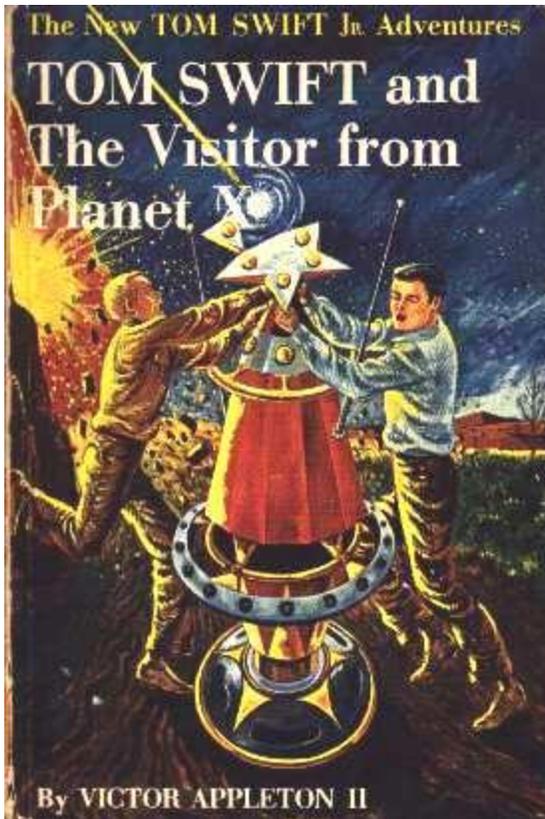
What impact would the space kite and associated inventions have on our lives? Early in the story, Tom highlights the major drawback to further exploration of space - cost. Even advances in space travel such as the Space Shuttle have not significantly lowered the cost of getting into space. The cost is related to the enormous amount of energy required to counteract the Earth's gravitational pull.

The space kite would allow unlimited space travel without having to carry large amounts of propellant since cosmic rays are ubiquitous once above the atmosphere. This invention could make everyday space travel a practical proposition. Manned travel to Mars and exploration of the outer solar system would be far more cost effective than is currently the case. Once above the atmosphere, the space kite would use free cosmic rays to power itself into space and leave the Earth's orbit.

The ocean-going application of the gravitex, the gravitex stabilizers would make ocean crossings smoother, although I understand that large ships already use gyroscopes to help stabilize their hulls during storms.

A working gravitex would open up space travel using antigravity and would even allow light structures to be anchored to the ground without foundations. This would have enormous implications for all types of transport and construction.

#17. Tom Swift and the Visitor from Planet X (1961)



Summary: Extracted from the dustjacket of the book:

Tom Swift Jr. and his associates at Swift Enterprises wait breathlessly for what may well be the most important scientific event in history -- the arrival of the visitor from Planet X -- a visitor in the form of energy. But there are factions at work determined to snatch the energy, which Tom has named Exman, from the young scientist-inventor's grasp. First, a series of unexplainable, devastating earthquakes threaten to destroy a good portion of the earth, and Tom suspects the Brungarian rebels who obviously would like to capture Exman and use the space visitor to further their own evil purposes.

With the security of Enterprises and Exman at stake, Tom creates two of his greatest inventions -- a Quakelizer to counteract the simulated earth tremors, and a container or "body" to house the energy from outer space.

If the earthquakes cannot be stopped, the entire world will be threatened by destruction, and the Brungarian forces will conquer the earth. How Tom utilizes all his scientific knowledge to produce swift-action results and outwit the

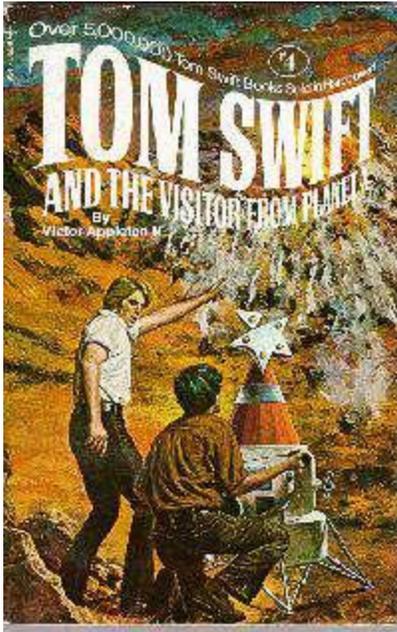
Brungarians makes one of the most exciting Tom Sift adventures to date.

Major Inventions

There are two main inventions in this book -- **Exman** (which Chow calls the "Ole Think Box") and Tom's **Quakelizer**. Because Exman comes into the picture first, I'll deal with him first.

When the story opens up, the reader finds out that Tom's space friends want to send him some "brain energy" in hopes that the brain energy can gather enough information about Earth to enable them to come and visit that planet. Tom, then, must build a body to receive this mysterious brain energy, and he does so. When the brain energy arrives, Tom christens the mechanical man and its brain energy as Exman.

To me, it is disappointing that Exman doesn't reveal any scientific secrets to Tom -- when I read the book, I was hoping that he would give him the blueprints to some fantastic device. I was also hoping that Exman might have a long conversation with Tom about life on his home planet, perhaps telling him some details of cities and things. Exman, however, doesn't do any of these things, and spends the majority of his time on Earth spying on rebel Brungarians.



You know, it's kind of strange that Tom never does meet with the space aliens. I would think that Exman would finally have given the space people the information they needed to come to Earth -- or if not Exman, then surely the secret data cache that Tom unearthed in Tom Swift and His Subocean Geotron would do the trick.

But even if they were never able to penetrate the atmosphere, why didn't they meet Tom in space? Many times throughout the series Tom's space friends sent him samples of life on other planets. Why couldn't they go and meet him, say, on Nestria or on the Moon? For that matter, when Tom had perfected his Cosmotron Express, why didn't he stop by at his space friend's planet and pay them a visit? There was the perfect chance, and he let it go by. What a shame.

How does Exman work? From what I understand, Exman works on very simple principles. His intelligence comes from the brain energy sent by the space friends. His motion is complementary of repelatron or treads. Other input (including commands from Tom) is fed through sensors. It sounds simple, but it's really quite an achievement -- after all, how would you build a body for an alien intelligence? Here are some of the passages from the book that deal with Exman's construction:

Tom wondered if the brain energy would be able to perform actions by itself, given the proper mechanical output devices. Or would he have to help it function via an electronic computer to digest incoming information or stimuli and then to respond through servo controls?

The problem was so baffling and complex that Tom became completely oblivious to the passage of time. He sketched out plan after plan, only to crumple and discard each one.

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Although both the problem and the solution were still hazy in his mind, a few ideas began to take shape.

A radio antenna would certainly be needed, to receive or transmit signals at a distance. And repelatron units would give the brain a way to exert force when it wanted to act. These were devices that Tom had invented to produce a repulsion-force ray. He had used the principle in both air and space flight.

A power plant might also be needed to generate additional energy in case the brain's own energy was very small. Lastly, there would have to be a control system for use either by the brain itself or by its human operators.

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The device stood about shoulder-high, with a star-shaped head, one point of which could be opened. The head would contain the actual brain energy. Its upper body, cylindrical in shape and of gleaming chrome, housed the output units through which the brain would react, and also the controls. Antennas projecting out on either side gave the look of arms.

Its "waist" was girdled with a ring of repelatron radiators for exerting a repulsion force when it wanted to move, by repelling itself away from nearby objects.

Below, the repelatrons as an hourglass-shaped power unit, housing a solar-charged battery.

The power unit, in turn, was mounted on a pancake-shaped transportation unit. This unit was equipped with both casters and a sort of caterpillar-crawler arrangement for the contrivance to get about over obstacles. Inside was a gyrostabilizer to keep the whole device upright.

How feasible is it to build an Exman/how much impact would an Exman have on civilization? I think that another question would be more appropriate: why in the world would you want to build an Exman? If you had the right pieces, mere assembly wouldn't be too hard. However, without the controlling brain energy the whole experiment is useless, because the brain energy controls the whole machine.

Now, if you wanted to build your own brain energy and your own Exman (as Tom kind of did in Tom Swift and His Giant Robot), you start getting into the field of cybernetics and artificial intelligence and immediately run into massive problems. Building a mechanical man is no mean feat. Your body, in case you hadn't noticed, is a very finely tuned and sensitive instrument and really puts to shame any machine that has ever been built. The brain alone is nearly incomprehensible, and making a mechanical duplication, as experts will tell you, is very close to an exercise in futility.

So, in short, it isn't possible -- not by a long shot.

The other invention in this book is the **Quakelizor**. The *Quakelizor* was invented by the request of the United States Government. It seems that the Brungarians had created several massive machines that, when

used in harmony, can generate massive earthquakes anywhere on the globe. As the Brungarians had started using the machines to reduce American defense factories to rubble, the Government desperately went to Tom Swift and asked that he come up with a defense.

Tom, then, obliged and created a device called a *Quakelizor*. The *Quakelizor* works by simply detecting any incoming waves and sending out a new wave that "cancels out" the Brungarian's wave. Equipped with several of these put at strategic points throughout America, Tom was able to put a stop to the Brungarian's earthquakes.

How does the Quakelizor work? First, let me describe how the Brungarians create artificial earthquakes:

Tom got up from his stool and paced about the laboratory. "Suppose the Brungarian rebel scientists have invented some sort of shock-wave producer--a device for sending vibrations through the earth's crust or the mantle underneath."

"Okay, suppose they have," Bud replied.

Tom snatched up a piece of chalk and made some quick diagrams on a blackboard. "Just this, pal. Let's say they set up two or three stations around the world for sending out such waves in a definite direction. Wherever the wave crosses an earth fault or another wave--*boom!* An earthquake!"

Bud stared. "No kidding, is that how those rats triggered off all these quakes?"

"It must be," Tom declared. "It's the only possible explanation."

"Good night!" Bud gasped weakly. "What a weapon! Just push a button every so often and you could blow up another country bit by bit--and no one could ever prove who was behind the attack!"

Now that you understand, here is how Tom created his wave deflector:

"I'd say your theory is right, Tom, about the quakes being produced by artificial shock waves...but how do we stop them?"

"I believe they can be damped out by opposing waves," Tom replied. "This is assuming that I can design the right sort of equipment to do the job--and also that we can set up a warning system to alert us of the enemy shock waves in time."

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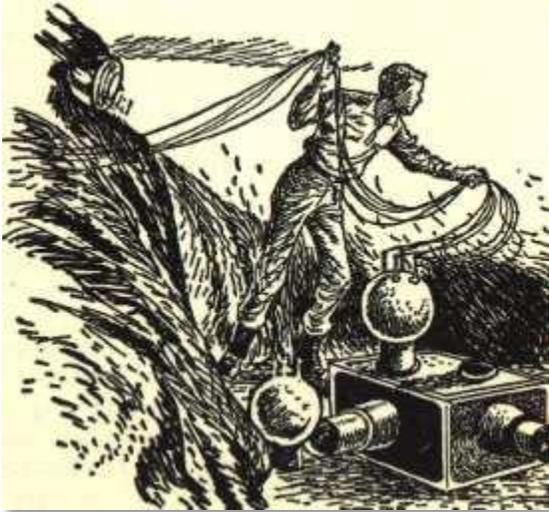
After a thorough discussion, it was agreed that the Defense Department would set up detectors at fifty checkpoints around the country. Tom would choose the exact spots. Detection data from the checkpoints would be fed to an electronic computer. The computer would establish the pattern, if any, of incoming enemy shock waves.

...

"Hank, you did a fast job on the container for the brain," Tom began apologetically, "but you'll really have to burn out a bearing on this one!"

Hank grinned. "I'm geared to action. Say, what do we call it, anyhow?" he asked.

Tom grinned. "Chow told me last night this gadget looked like a fireplug under a rose trellis and I ought to call it Fireplug Rose! But I've given it a more dignified name--the Quakelizer, which stands for an underground quake wave deflector.



Briefly, Tom explained the various parts of his latest invention, which consisted of a hydrant-sized cylinder to be inserted into the ground, with magnetic coils near the top. A smaller hydraulic cylinder, mounted above this, was wired to a metal framework and radio transmitter.

"This setup will detect any incoming enemy shock waves," Tom said. "We'll need fifty of 'em, so turn the job over to Swift Construction. And have Uncle Ned put on extra shifts."

The Swift Construction Company, managed by Ned Newton, was the commercial division which mass-produced Tom Jr.'s and Tom Sr.'s inventions.

Information from the detector-transmitters, Tom went on, would be fed into an electronic computer at the Bureau of Mines in Washington.

The Quakelizer itself was housed in a massive cube-shaped casting with two large spheres mounted on top. From each of its four sides jutted a hydraulic piston.

"How does it work, Tom?" Hank asked.

"Dual-control spheres on top," Tom explained, "will receive by radio signal the pulse frequency computed in Washington"

He added that inside each sphere was a "pulse-maker." This would produce changes in the pressure of the hydraulic fluid by affecting the kinetic energy of the fluid's atoms. [Note: in other words, it will make the fluid move.]

The pressure changes would then be enormously magnified in the four hydraulic output drivers. When the unit was embedded in rock, underground, the huge pistons would send out counter shock waves through the earth's crust to neutralize the enemy waves.

How feasible is it to build a Quakelizer? In my opinion it would be very, very difficult. How in the world do you create vibrations in the earth's crust strong enough to span the globe? Moreover, how do you create a signal strong enough to counteract those vibrations? It seems to me that the job would be a very, very hard one.

It seems to me, though, that this really isn't a great loss. Tom built the *Quakelizer* for one purpose, and it was used to fulfill that purpose. The machine, I'm afraid, is specially built to halt artificial earthquakes, and there really isn't anything else that it can be used for.

A Parting Word

In this book, Tom Swift Jr. tries to create artificial brain energy to continue his experiments on. His father has a few words to say about this, and I found their conversation to be so interesting that I've copied it below for you to read:

Mr. Swift arrived at the laboratory an hour or so later. He found Tom setting up an experiment with a glass sphere to which were affixed six powerful electromagnets. Two shiny electrodes, with cables attached to their outer ends, had also been molded into the glass. Bud was looking on, wide-eyed.

Tom explained to his father that he had blown the sphere himself, following a formula adapted from the quartz glass used for view panels in his space and undersea craft.

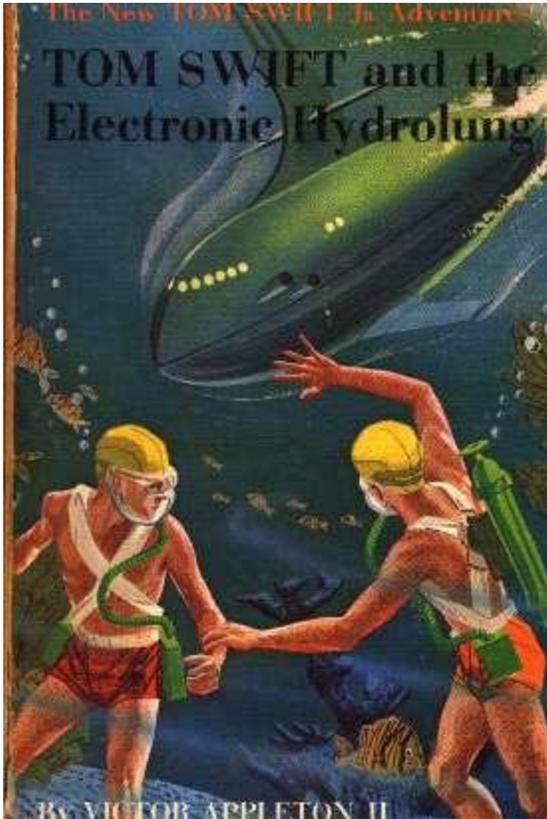
"What's it for, son?" Mr. Swift asked, after studying the setup curiously.

"Don't laugh, Dad, but I'm trying to produce a brain of pure energy. A substitute for Exman, so we can go ahead with our sensing experiments."

Mr. Swift reacted with keen interest and offered to help. "But remember, son," he cautioned, "at best you can only hope to produce an ersatz brain energy -- which will be vastly different from the real thing. Don't forget, Tom, the mind of a human being or any thinking inhabitant of our universe is based on a divine soul. No scientist must ever delude himself into thinking he can copy the work of our Creator."

"I know that, Dad," Tom said soberly. "Man's work will always be a crude groping, compared to the miracles of Nature. All I'm hoping to come up with here is a sort of stimulus-response unit that we can use for testing any sensing apparatus we devise."

#18. Tom Swift and the Electronic Hydrolung (1961)



The following summary was written by Graeme Woods. Thanks yet again for volunteering! This is the last Tom Swift Jr. summary of the lot: with this summary, the Complete Tom Swift is now complete!

Summary: This book commences with Tom Swift Jr. working with the Navy to recover a Jupiter probe missile designed and built by Swift Enterprises on behalf of the government. However the Brungarians intercept the probe and Tom must race against time to recover it from the bottom of the ocean before the Brungarians can steal the probe and its scientific data. As the story unfolds, Tom invents several underwater devices to assist with the recovery and counter the threat of a new stealth submarine developed by the Brungarians.

Major Inventions

This book introduces a number of inventions that fall into two categories; devices that assist skin divers to recover the Jupiter probe (electronic hydrolung, hydrolung density control device, hydrolung ion drive) and devices that counter the threat of the new Brungarian stealth submarine (anti-detection jetmarine, quality analyzer sonar).

Electronic Hydrolung

Mr. Swift suggests the hydrolung:

"What's needed is a new type of breathing device - one that will eliminate bulky air tanks and permit a skin diver to stay down for long periods."

The hydrolung is a small device that extracts dissolved oxygen from water to allow skin divers to breathe underwater.

How does the electronic hydrolung work? The hydrolung uses the osmotic air conditioning principle described in Tom Swift and His Deep-Sea Hydrodome. This is how Tom describes the process in that book:

Going over to a blackboard, Tom sketched out his idea. "We'll pump in sea water and extract its dissolved oxygen by osmosis through a membrane - like this. Then we'll dry the oxygen in a dehumidifier and pump it into the dome through a heating and decompression unit. The stale air is then drawn out by a compressor, and the waste carbon dioxide is given off to the same sea water in exchange for the oxygen we removed. Of course there would be a constant circulation of both sea water and air."

This is how Tom explains the hydrolung:

"How does it work?" Phyl asked, fascinated.

Tom explained, "Actually its function is to replace the carbon dioxide that I exhale with fresh oxygen drawn from the water. Otherwise, although the carbon dioxide I'd breathe out would be a very small amount at a time, it soon would make the air unfit. The nitrogen, which makes up much of the air we breathe, is chemically inert and can be used again and again."

He pointed to a round screen on one side of the unit. "This is the water intake," Tom went on, "and this other screen is where the water comes out after we've removed its oxygen."

Near the forward end of the unit, a semirigid plastic tube was connected, leading up to the face mask. At the rear was a power port for inserting a small solar battery.

"What about this little tuning knob?" Sandy asked.

"That's the rate control for adjusting the output frequency to the wearer's breathing rate." Tom added, "I've decided to call the whole apparatus an 'electronic hydrolung.'"

Unfortunately on its first test, Tom suffers from the bends upon ascending because the pressure change allows nitrogen bubbles to form in his blood. He decides to eliminate this problem:

"I'll install a special device to remove the nitrogen as the wearer exhales," Tom explained. "Then a valve will feed in helium to replace it. Since helium doesn't dissolve in the blood like nitrogen does, it will not bubble out when the pressure is reduced. Should have thought of that before!"

"But you'll need a tank for the helium, won't you?" Bud objected.

Tom shook his head. "Enough can be compressed into a small capsule to supply the wearer's needs. Remember, it can be used over and over again."

Would the electronic hydrolung work? The principle of the electronic hydrolung is sound; fish obtain their oxygen from water using their gills. Their gills perform the role of Tom's osmotic membrane.

Scientists tried a device that is similar to the hydrolung in 1970. However no one has yet devised a practical hydrolung although new materials are allowing us to get closer to this. One problem is extracting enough oxygen from water for a person to breathe. Since Tom's hydrolung has a solar battery powering it, this could be used to pump water through the hydrolung which would make the idea practical since the osmotic membrane would not need to be so efficient.

The solar battery is a sort of super capacitor that is charged in Tom's space outpost by solar radiation. Although scientists are now working on super capacitors that can store far more energy than today's batteries, we don't currently have anything with the power density of a solar battery.

The osmotic membrane must perform several roles; it needs to take oxygen from the water, dissolve exhaled carbon dioxide into the water and remove exhaled nitrogen and retain exhaled helium.

I believe that an electronic hydrolung will ultimately be possible. A simple osmotic membrane may not provide the performance needed and I believe that it will comprise a combination of special materials with high surface areas and affinities to particular gasses.

What impact would the electronic hydrolung have on our lives? A hydrolung would open up skin diving because bulky and inconvenient air bottles would no longer be needed. Also a diver would not need to come up for air since the hydrolung could simply extract oxygen from the water as required. This means that man could live beneath the sea for extended periods. This would open up underwater farming.

Since the hydrolung replaces nitrogen dissolved in the blood with helium (which does not dissolve in the blood), the risk of the bends (as a result of pressure changes causing the nitrogen to come out of solution into cells as bubbles) is eliminated.

Hydrolung density control device

The density control unit allows a diver to ascend and descend by varying his underwater density.

How does the density control device work? This is how the book explains the density control device:

"It's a density-control device," Tom explained. "A substitute for ballast tanks, you might say. It'll enable us to rise or sink to any depth at will, simply by varying our underwater density."

Tom said the device would be carried in a small case, hooked to the diver's belt, with a single tuning-knob control. The "throttle" or speed control for the ion drive would be housed in the same unit.

As you can see, the description doesn't give any indication of how this device works.

Would the density control device work? I believe that it is improbable that a device that can be carried in a small diver's belt mounted case could change the density of a diver, unless it uses some previously unknown effect.

Fish have swim bladders that can be filled with oxygen and nitrogen from the blood to adjust buoyancy to whatever depth the fish is swimming at so that the fish can maintain its level without effort. Submarines use ballast tanks to achieve the same result. In both cases, the size of the bladder or tank is relatively large in proportion to the size of the fish or submarine. Some exploration submarines such as the Bathyscape carry weights to be released when they need to ascend.

A scuba diver wears a weight belt to achieve neutral buoyancy which allows the diver to swim up or down easily.

What impact would the density control device have on our lives? A working density control device would have its biggest impact in submarine technology. There would no longer be a need for bulky ballast tanks. Also scuba divers would no longer need heavy weight belts to overcome excess buoyancy.

Hydrolung ion drive

The ion drive is a small but powerful underwater jet that is mounted on a diver's back to provide underwater propulsion.

How does the underwater ion drive work? The underwater ion drive is described as:

"...a slender metal cylinder, two feet long, with an inner concentric tube projecting at each end."

This is how Tom explains the idea to Bud:

"But we'll need speed to cover the area. So first I want to add an ion drive to our equipment."

"Ion drive? For underwater?" Bud, who was familiar with ion propulsion for spaceships, wrinkled his brow in a puzzled frown.

"A goofy idea just occurred to me, but I think it may work out," Tom replied. He seized a pencil and began explaining what he had in mind.

The drive unit would take water into itself, separate the ionized molecules, and expose them to an electric field. Thus a stream of water would be forced out. This procedure, in turn, would set up a siphoning action through a central tube - in effect, creating a small but powerful water-jet motor.

So it is effectively a pump with no moving parts that uses an electric field to repel the charged ions present in water. The ion drive unit in the story is so powerful that the water jet pins Tom against the wall of the test tank.

Would the underwater ion drive work? In principle, this could work. Even pure water contains ions that moved under the influence of an electric current. This could theoretically be translated into motion. Electrophoresis uses this effect to separate out different substances from solution for analysis; the substance is soaked into filter paper and a positive current is applied to one side of the paper and a negative current is applied to the other side. The various substances migrate towards the opposite polarity.

Ion drives are being developed for spacecraft. Ion drives provide very low thrust but can be operated for long durations (in contrast a chemical rocket achieves speed through high acceleration over a short time period).

However in practice I don't think the underwater ion drive would work because the energy input relative to the motive force produced would make a conventional propeller arrangement far more practical.

What impact would the underwater ion drive have on our lives? If the underwater ion drive worked, I would see its biggest application in marine propulsion systems. Instead of complex and relatively inefficient propeller systems, the ion drive would directly convert electrical energy into motion without any moving parts.

Submarines could use a similar system to avoid detection of propeller noise. As I recall, in "The Hunt for Red October", the Russian submarine uses a "worm drive" which apparently works in a similar way.

Anti-detection jetmarine

The anti-detection equipment fitted to a jetmarine prevents detection of the vessel either by hydrophone or sonar.

How does the anti-detection jetmarine work? The idea on the anti-detection equipment first comes to Tom while he is puzzling about how the Brungarian submarine avoids being detected by sonar:

The idea certainly sounded feasible. Suppose the submarine used a great many "microphones" - or receiving transducers - to pick up the sonar pulses beamed out by another craft trying to detect it? These impulses could then be passed on and sent out by speakers on the opposite side of the sub, and relayed along on their underwater path of travel.

Thus the sonar waves would appear to be striking no obstacle - and no echo would return to the sonarscopes on the search craft!

Initially Tom wires up a jetmarine with hundreds of mikes and speakers all over the hull for testing. Later he develops a plastic coating (made of Tomasite) that incorporates the transmitting and receiving transducers spaced closely together, with the leads combined into a single flat tape going to the central control unit.

Another way of detecting a submarine is to listen to the sounds of the propellers or other machinery sounds. Tom realized that even if a submarine is invisible to sonar, it is just as vulnerable if an enemy can hear the noise it makes. This is how he decides to address this issue:

"Well, we can never do away with the noise of a sub's propulsion machinery," Tom began. "That goes without saying. So we'll have to camouflage it - lose it in the underwater jungle noises, so to speak."

Bud scratched his head. "How do we do that?"

"By amplifying the natural undersea sounds all about it," Tom explained. "Fish and all forms of underwater life make a background noise over the hydrophones, you know."

As Bud nodded, Tom went on, "So we simply step up the volume till the sub's own noise gets drowned out or 'wasted' in all the racket."

This could be done, he concluded, with fairly simple amplifying equipment. Bud, Hank, and Arv were jubilant at the idea.

Would the anti-detection jetmarine work? Most modern military submarines use anti-detection technologies, the details of which are closely held military secrets.

In order to evade sonar, submarines now have a special sonar absorbing coating. This is a passive defense, in contrast to Tom's idea that uses active elements. The coatings prevent a reflection of the sonar impulse, which effectively hides the submarine. This is similar in concept to the B2 stealth bomber, which is designed in such a way to minimize the radar reflections.

I think that Tom's idea of using transducers has some merit. My only reservation is that the plastic coating (unless it absorbs sonar impulses) may reflect back some of the sonar. Also the transducers themselves may not absorb the impulses. Presumably Tomasite absorbs or scatters enough of the impulses to avoid detection.

Some time ago on a science program I saw some work being undertaken for the US Army to reduce the visibility of soldiers that uses a similar active approach (but with light rather than sound). The soldier would wear a suit that is made of closely spaced light emitters and detectors. The emitters at the front of the suit would display the image that the detectors picked up from behind the suit and vice-versa. This makes it very difficult to actually see the soldier.

Tom's idea of amplifying natural undersea sounds is also very interesting. The idea is to reduce the signal to noise ratio by increasing the amount of background noise. I am not aware of this technology being used on submarines. It might be possible to detect the presence of a submarine using this technology by an increase in background noise.

Normally, submarines use the opposite approach of reducing propulsion noise by using quieter propeller designs and other techniques to reduce the submarine noise below the background noise of the ocean. By way of analogy, the stealth bomber uses special exhausts to reduce the infrared signature of its engines so that they can't be detected above ambient "noise". The overall effect is to reduce the signal to noise ratio which is the same idea as in the book, but achieved in a different manner.

In summary, I believe both approaches are probably feasible, even if they are not being used in the way described in the book.

What impact would the anti-detection jetmarine have on our lives? Modern submarines do use sonar-absorbing coatings and are designed for low noise, so technologies with a similar effect to those described in the book are now in use.

Quality analyzer sonar

This invention counters the Brungarian submarine stealth technology.

How does the quality analyzer sonar work? The quality analyzer sonar is Tom's invention to detect the stealth Brungarian submarine. The Brungarians used their "invisible" submarine as a propaganda coup. This is how the book describes the invention:

Tom explained that the new system he had in mind would send out a complex pulse - that is an underwater sound wave with many harmonics instead of a single tone, sharp peaked sound impulse.

"This will make it less likely that their anti-detection gear will absorb all of it," Tom went on. "What's not absorbed will return as an echo. I'm also going to modify our receivers. But I've still not worked that out."

Bud nodded, his forehead puckered in a look of concentration. "So-?"

"So our sonar picks up all that hash, and by means of a computer setup filters out the sub's real echo from the shadow reflections."

The book describes a "correlation calculator" that is used to determine how close the returning pulse is to the original pulse and displays blurred echoes or shadow echoes in red on the screen. This would be an indication that a stealth submarine was detected because it would absorb a range of frequencies and reflect some others. This explains the name "quality analyzer sonar" since it measures the quality of the returned sonar pulses to determine the presence of an enemy submarine.

Would the quality analyzer sonar work? The quality analyzer sonar would work if the Brungarian submarine would absorb only certain frequencies. This would be likely if an "active" stealth approach is used. If a passive sonar absorbing coating was used, it is likely that this would be able to absorb a large frequency range.

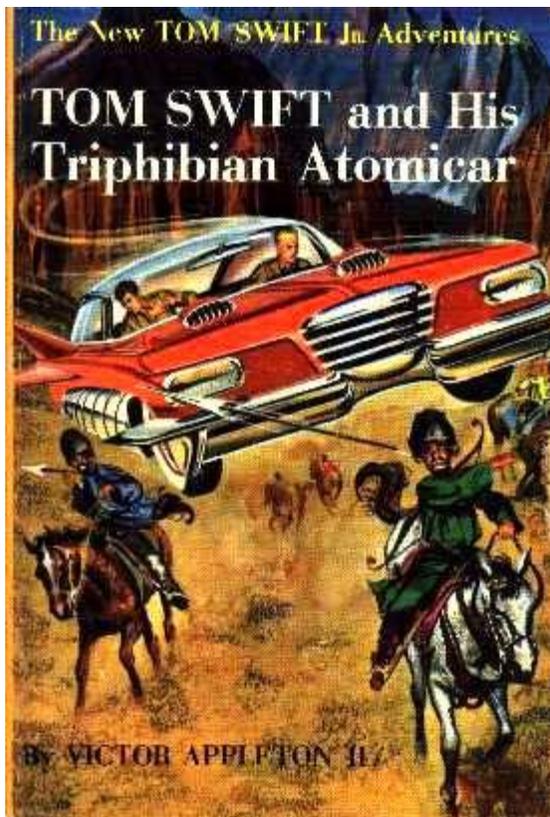
The book preempts the computer systems now in use to automatically analyze sonar data. Advanced technologies such as neural networks are now being used. Perhaps Tom uses a simple form of neural network in his "correlation calculator" since it is described as a computer filter.

What impact would the quality analyzer sonar have on our lives? Technologies similar in principle to the quality analyzer sonar, but far more advanced, are in widespread use in the submarines throughout the world. I attended an artificial intelligence conference in 1995 and there was a large contingent of scientists who presented papers on similar systems that they were developing for a submarine fleet.

Update on 3/5/2002: I received an e-mail a few days ago from Paul Fronberg that told me that the Japanese had successfully tested a ship with an underwater ion drive! It seems that there was actually a patent placed on this idea around 1961 (patent number 2,997,013).

Looks like Tom Swift knew what he was doing after all!

#19. Tom Swift and his Triphibian Atomicar (1962)



Summary: Extracted from one of the title pages of the book:

An atomic-powered car that travels on land, water, and through the air -- Tom Swift Jr.'s latest invention -- is an extraordinary achievement. But even its young inventor could not anticipate what a dramatic role the Triphibian Atomicar would play in a technical aid mission which takes Tom and his top-flight engineers to the untamed Asian land of Kabulistan, to help the new republic develop its natural resources.

Time and again Tom must pit his skill and courage against fierce, nomadic tribesmen. But this is not a one-sided conflict between the ancient and the modern. Beneath the façade of thunderous hoofbeats, spears, and scimitars is a scientific mastermind bent on destroying the members of the Swift expedition in order to conceal from the Kabulistan government his discovery of a fabulous ruby mine lost for two centuries.

After a series of danger-packed episodes, Tom and his pal Bud Barclay are caught in a seemingly inextricable, underground trap. How Tom builds a "do-it-yourself" rocket in a cavern laboratory and sends it homing for aid is a brilliant stroke of ingenuity.

The young scientist-inventor's daring exploits in the primitive Middle East country of Kabulistan will keep the reader breathless with suspense until the last page of this gripping story.

Major Inventions

This book is from what might be Tom's most prolific period. There are a number of major, important, earth-shattering inventions in this book, and I will deal with each of them one at a time.

The first and perhaps the biggest invention in this book is the **Triphibian Atomicar**. Below I've typed in the first few pages of the book, so that you can get a feel of this amazing invention for yourself:

...She and Sandy soon forgot the frightening experience the sheer exhilaration of spinning along as quietly as a breeze. The lack of engine noise, Tom explained, was due to the car being driven by four small electric motors, one of them mounted at each wheel.

"And that steering lever does everything?" Phyl asked.

"Practically everything," Tom said. "Accelerates, slows, stops, turns, or reverses--depending on how you move the stick."

Passing motorists goggled admiringly at the bronze, bubble-hooded sports car. As Tom drove farther into the country, the highway skirted pleasant green woodland on the left, while off to the right the blue waters of Lake Carlopa sparkled in the June sunshine.

"How about that *triph*ibian feature you mentioned?" Sandy asked from the back seat.

"Well, you know what *amph*ibian means."

Sandy grinned at him in the rear-view mirror. "Don't pin me down, professor, but it refers to something that exists on both land and water, doesn't it? I know the Marines make amphibian landings and an amphibian plane can take off from land or water."

Tom nodded. "Well, my atomicar is *triph*ibian--meaning it can get around on land, through the air, or over water."

To demonstrate, Tom pushed the repelatron switch on the dashboard, and again the car's wheels soared gently up off the road.

"A repelatron lifter does the trick," Tom explained. The repelatron was a repulsion-ray device that Tom had invented to drive his revolutionary spaceship, the *Challenger*.

Tom brought squeals of excitement from the girls by veering off the highway, hedgehopping straight down to the shore of the lake, and then skimming out over the waves.

"Oh, this is fun!" Phyl exclaimed. "What makes the car go, now that the wheels aren't driving us?"

"A small air jet," Tom replied. "Doesn't take much motive power once we're air-borne--you could push it along with one finger."

Sandy looked down at the blue scudding surface just below them. "It's like surf-sledding!" she said gleefully. "But what if our repelatron conked out--would we float?"

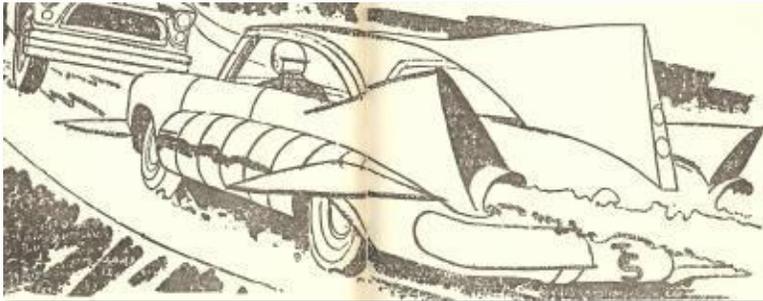
"Sure." Tom flicked the switch and the car settled down on the waves with a slight splash. "Everything's watertight and there's an air ballast tank on each side of the frame." "Great for a fishing trip!" said Bud.

"It'll be great for all sorts of transport purposes," Tom said. "This baby can cross rivers and operate over any terrain--swamps, wild bush country, even mountainous areas."

Its repelatron, the young inventor added, made the atomicar far nimbler than ground-hugging air-cushion vehicles. Moreover, it would not churn up clouds of dust on dirt roads as they do [notice the swipe here against other science-fiction vehicles that were in books at the time]. Tom proved its versatility on the way back to town by more hedgehopping stunts--even skimming a treetop.

"Seriously, though," Tom added, as the girls caught their breaths amid gasps of laughter, "the biggest selling point is that the car will run for hundreds of thousands of miles at almost no operating cost--that is, when my new atomic power capsule is installed."

How does the Triphibian Atomicar work? As the above passage indicated, the car is a perfectly ordinary car except for two things: it can fly, and it has no need for fuel. Flight, according to Tom, is possible because of the car's repeltrons. The car's extraordinary range of "hundreds of thousands of miles" is due to Tom's unique atomic power capsule -- another amazing invention that I will discuss later on.



How feasible is it to build a Triphibian Atomicar? As is the case for nearly all the Swift inventions, the answer to this question depends on the feasibility of the Swift inventions that the atomicar is built upon -- in this case, the repelatron (invented in *Tom Swift and his Deep-Sea Hydrodome*) and the atomic power capsule.

Now, obviously, if you don't have a repelatron or a power capsule you can hardly build the car the way Tom did. You would have to go about it a completely different way, and you would have to find a way to get today's technology to work and yet still make the machine look like a car. Flying vehicles that are legal on the highways have been built, but the result only vaguely looks like a car, really seems to belong more in the air than on the highway, and is extraordinarily expensive.

Today's technology just cannot build a cheap car that can easily maneuver in three dimensions. The mechanical challenges of such a vehicle are really more than we can handle today. Perhaps one day we'll have mass-produced triphibian cars, but they will only appear after a major scientific breakthrough -- antigravity, perhaps -- hits the streets.

How much impact would a Triphibian Atomicar have on civilization? The atomicar, as it is presented in this book, has an enormous range of potential uses, and if Tom were to create special models of this invention it would have even more. Here are a few ideas:

Personal Uses. Imagine having a car that could fly, swim (and possibly submerge) or drive, and had enough fuel in it the day you bought it to last until you drove it to the junkyard. If this car were priced cheaply enough, who wouldn't want one? Gasoline stations would go out of business nearly overnight for the simple reason that the car does not use gasoline and can take a round trip to the moon with the fuel built into the car. Because the car uses no gasoline, it does not deplete fossil fuel reserves and thus frees up billions of barrels of oil a year. The car is also a Zero Emission Vehicle (goodbye, smog!) and *completely silent* (imagine that!), making it an extremely environmentally friendly car.

Out-of-state and out-of-country travel would doubtless boom tremendously. After all, if fuel isn't a factor and if the car has enough speed, why not drive over to Paris or London or Sydney and spend the weekend? Or why not tackle Tibet or Siberia or the North Pole, for that matter -- normally inaccessible locations could, after all, be easily reached with a vehicle as easily maneuverable as an atomicar.

Imagine what it would be like to fly down the Grand Canyon, or to soar high over the majestic Rockies, or to look down on teeming tropical rainforests. Equipped with even a basic atomicar you could get a birds-eye view of any place on Earth. This machine, with a few modifications, could have a lot of other uses as well. If Tom were to make this car submersible it would be a great replacement for his *Diving Seacopter*. Wouldn't it be cool if you could fly right off the road and plunge into the Atlantic Ocean? Imagine being able to dive deep beneath the sea and race alongside a blue whale. Or cruise alongside a group of dolphins. Or cruise over sunken ships. Or pay your respects to the Titanic.

Another edition Tom could put out would be an atomicar car suitable for long-distance space flight. It really wouldn't be too difficult to make this one -- just replace the air jet with a powerful repelatron, make the ship airtight, add one of Tom Swift's foolproof navigators, and there you go! Imagine having a quick afternoon jaunt to the Moon, or cruising over to Mars for the weekend, or taking a week off to fly by the magnificent Saturn. What could be better?

Other Uses. A larger edition of the Atomicar suitable for transport could be enormously useful in countries with either poor infrastructure or huge areas of swampland and rainforest. Imagine how easy an atomicar would make it to get supplies to and from desolate areas (after all, you wouldn't even need a road or a place to land!). No longer could any region of earth be truly called hard-to-reach. Mines that had to be passed up before because they were too remote could go into operation. Remoteness, in fact, would no longer be an issue.

An atomicar, with a few modifications, would really be the perfect vehicle for use on other planets. Flight, you know, is impossible on the Moon because the moon has no air. An atomicar, on the other hand, doesn't need air to fly! And why use a slow ground-based lunar rover when you can zoom over the lunar surface in an atomicar?

Another important invention is the **Atomic Power Capsule**. The Atomic Power Capsule (also called the Mighty Midget) is basically a miniaturized nuclear power plant that is equipped with enough fuel to last for years. It is quite an amazing invention -- I would say that it rivals the repelatron itself.

What does the atomic power capsule look like? Here is the description that was provided in the book:

The power plant was housed in a small, rectangular, capsule-like casing. It has a copper boss at each end, one positive and one negative, through which the electrical output would be drawn off. A sheathed cable led from the capsule to a small control box, which was connected to an outside control panel.

How does the atomic power capsule work? The book, believe it or not, does not say, so I really have no idea. In fact, I can't even hazard a guess -- the entire idea of creating a machine no bigger than a microwave that can harness nuclear power is just mind-boggling. My only guess is that it uses a fantastic type of nuclear fusion -- cold fusion, perhaps.

How feasible would it be to build an atomic power capsule? I can't even fathom how it would work, so I can hardly guess as to how practical it would be. Maybe someone out there, someday, will have a fantastic idea that will lead to an atomic power capsule. I wouldn't hold my breath, though, if I were you.

How did Tom deal with the threat of a capsule meltdown? Nowhere in the book is there mentioned even the possibility of the capsule having a runaway chain reaction and exploding. There were pressure problems, but Tom's durastress alloy solved them. Evidently, if the book is to be believed, the type of atomic reaction Tom used was vastly different than the type commonly used today. Perhaps, as I said before, he used a type of cold fusion cell. Cold fusion cells, however, do not generate any pressure...

How did Tom deal with the radiation from the atomic power capsule? While the capsule is known to release radiation, there is no account anywhere as to how Tom dealt with it. (Perhaps I'm wrong; if so, then e-mail me.) My guess would be that he coated the capsule with Inertite, a material he developed in *Tom Swift in the Caves of Nuclear Fire* that was impervious to radiation.

How much impact would an atomic power capsule have on civilization? An atomic power capsule would probably have an enormous impact that would mainly be focused on countries that have no centralized power supply. In such places the capsule would be of enormous use since it's cheaper and can be built faster than a power plant and requires no infrastructure.

A good example of its potential uses is actually found in this very book. Look at how Tom used the capsule to develop Kabulistan. Expensive dams and nuclear power plants, as Tom pointed out, were simply forgone, as they were not needed. Instead, every large factory, hospital and school was equipped with their own atomic power capsule. This, of course, had enormous benefits. Once you had paid for the capsule, you had enough electrical power to last for years, depending on the size of the capsule and the power you used. Not only that, but the power it provided could be counted on -- no storm, however, severe, could knock out your power supply.

Another important invention, this one crucial to the success of the atomic power capsule, is **Durastress**. Durastress is a tremendously strong *plastic* that is capable of withstanding enormous pressures. Tom used its tremendous strength in his atomic power capsule to keep the capsule from exploding under its own pressure.

How does Durastress work? I have no idea. No explanation of any kind was provided in the book.

How feasible is Durastress? Once again, since I have no idea how it works, I can offer no ideas on how feasible it is.

How much impact would Durastress have? That depends on how expensive Durastress is to manufacture. If Durastress is quite expensive then it would probably only be used in areas that absolutely require light but high-strength materials (such as space flight or military aircraft). If, on the other hand, it was very cheap (which I doubt), then it would probably be used in all sorts of areas. Extremely light cars could be made out of it. Bridges could use it. Passenger jets could use it. Buildings could use it. And on the list goes.

The last important invention in this book is Tom's **Mechanical Homing Pigeon**. (I really doubt that that is its proper name, but it is the only one that I could find.) The Mechanical Homing Pigeon is kind of like a cross between an aerial plane and a homing pigeon.

How does the Mechanical Homing Pigeon work? In the words of Tom Swift:

To accomplish this, Tom went on, he proposed to build a fleet of small atomic-powered drone planes. These would carry Tom's detecting Damonscope to spot radioactive ore, and his father's mineral detectors. By sending the drones out in a search pattern across the whole country, it would be possible to locate any deposits quickly.

"But if you're using unmanned drone planes, how do you expect to map the deposits?" Ned Newton asked with a puzzled frown.

Tom grinned. "Chow gave me the idea last night--a magnetic homing device."

Tom sketched his plan on paper. Each plane would carry a magnetic sensing unit--trailed through the air at the end of a cable. This would "sense" the patterns of terrestrial magnetism that the plane passed over.

These patterns would be recorded on a magnetic memory drum, connected to a master steering unit inside the plane. When the drone was "played back" through the master unit, the plane would automatically retrace its course to home base.

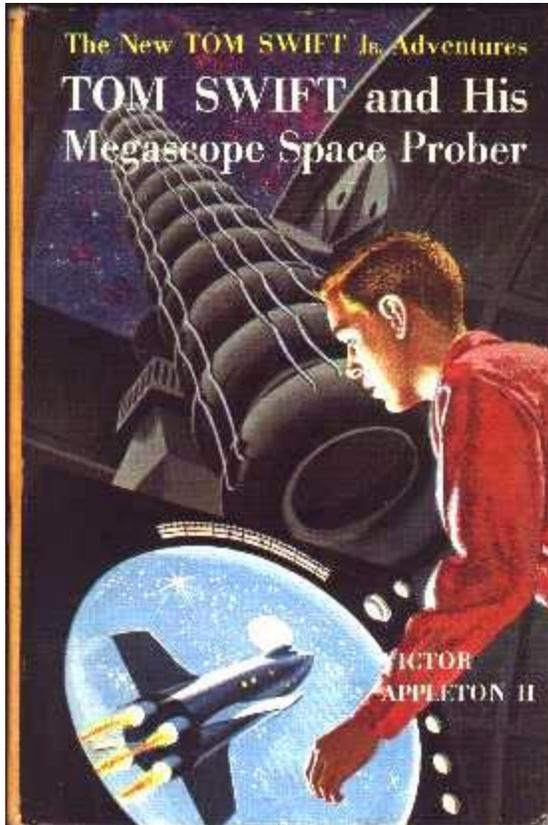
"Each plane will beep a radio signal whenever it detects a mineral deposit," Tom said. "This will start the playback. And then the plane returns to base, we simply check its flight course as recorded on tape to get the location of the deposit."

How feasible would it be to build a mechanical homing pigeon? From what I understand, the basic principles -- especially the homing device itself -- works out just fine. However, building a reliable unmanned robotic drone is a tremendous task -- it isn't anywhere near as simple as Tom let on. The Air Force has been trying to build such unmanned drones for *years* and has had a rough time at it. In short: while yes, it's possible, and no, it doesn't break any laws of physics, it would be an enormously difficult project, and would probably take many, many years to perfect.

How much impact would a mechanical homing pigeon have? The mechanical homing pigeon would probably find a large market in the mining industry, and a vast number of other industries could use the basic robotic drone. (Don't forget that a basic, reliable, unmanned, cheap robotic drone is still merely a dream). The defense department, for example, could use them both as spy planes and fighters. Airlines could use a scaled-up and reliable version to do away with pilots. Conservationists could use them to track the movement of animals. Firefighters could use them to help spot and fight forest fires. Farmers could use them as crop dusters.

In short, any field that could use an aerial tracking device would find these useful, not only because the drones are unmanned but also because they can stay up in the air for *years*.

#20. Tom Swift and his Megascope Space Prober (1962)



Summary: Extracted from the interior of the book:

"Someone has stolen your invention!" Bud Barclay tells his pal Tom Swift Jr. And when a scientist in France publically tests a helium-extraction machine, it seems Bud is right. The machine explodes, precisely as Tom predicted any model made from his own unperfected plans would do. But the explosion is only the beginning of one of the strangest mysteries in the young scientist-inventor's career. Time and again he is forced to combat a sinister secret enemy while he works to complete his megascope space prober, designed to "keep an eye on the universe."

Meanwhile, Bud is offered the opportunity to participate in a manned government space probe to Venus. Although the AstroDynamics Corporation, a competitor of Swift Enterprises, is directing the project, Tom encourages his friend to make the flight in the interest of the United States.

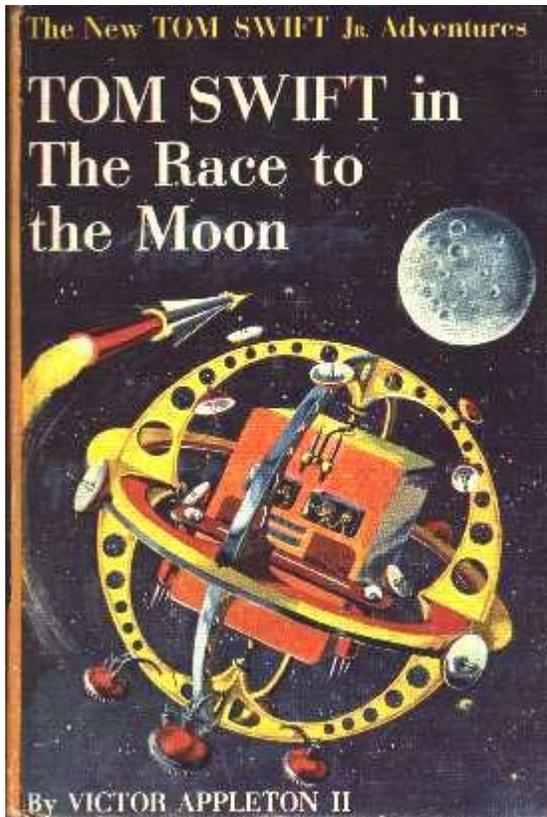
When another secret invention of Tom's becomes the target of his enemy, all evidence points to the fact that an unidentified traitor at Swift Enterprises is in league with a criminal mastermind outside the plant.

How Tom is trapped when he unmasks his enemies, how he engineers a bizarre escape, and how he executes a fantastic rescue when Bud's spaceship goes out of control on its flight to Venus are just a few of the suspense-filled highlights in the young space pioneer's latest challenge.

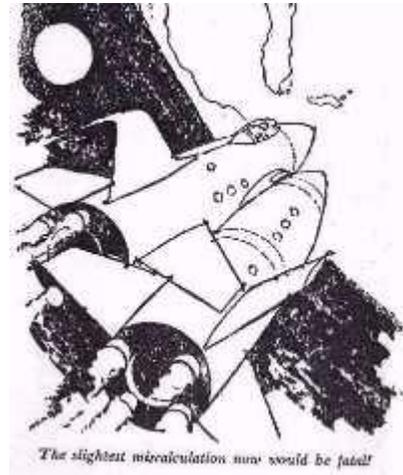
First, the Mistake

Near the very end of this book, Tom Swift rescues the AstroDyne rocket with his Challenger. Below is the picture, located at the very front of the book, which depicts this rescue. There is only one problem with this picture: the rocket shown is NOT the Challenger! To the right is the cover of "Tom Swift in the Race to the Moon", which depicts the *real* Challenger.

The actual *Challenger*



The *Challenger*, as depicted in the frontispiece of this volume



Major Inventions

There are two major, amazing inventions in this book, and I will deal with them one at a time.

The biggest (and most expensive) invention listed in this book is the **Megascope Space Prober**. The Megascope Space Prober is basically a radio telescope. It does differ from modern radio telescopes, however, in one area: instead of sensing sensitive radio waves emitted by distant stars, it uses a special kind of radio wave to "scan" the surface of different objects and thus create a picture.

How does the Megascopel Space Prober work? This book devoted a lot of time and words on Tom Swift's inventions. Evidently the author had a very good picture of the working theory. Here are some of Tom's comments, discussions and explanations for his *Megascopel Space Prober*.

"How's your 'Window on the universe' coming, son?" Mr. Swift inquired, his eyes twinkling.

"Still in the planning stages," Tom replied, "although I have my high-gain signal amplifier worked out."

Bud grinned. "It's still sort of a Greek puzzle to me, skipper. You mean this rig will let us see things in the universe that are way beyond range of the biggest observatory telescopes?"

Tom nodded. "I hope so. Actually it won't give us light images of heavenly bodies such as we see with an optical telescope. Instead, we'll be scanning outer space with a high-powered radio signal--and the reflected signal will 'paint' a picture electronically on a cathode-ray tube."

"I get it," Bud said. "Like seeing a transmitted picture of the star on a TV screen, eh?"

"Right."

"An exciting idea," Mr. Swift said enthusiastically. "Imagine peering into every corner of the universe--seeing stars and galaxies we never dreamed of before! This could be your greatest invention yet, Tom."

..."Got a name for this Mighty Eye?" Bud asked Tom.

"I've decided to call it a megascopel space prober," the young inventor said thoughtfully. "'Mega' stands for 'million'--or at least 'much greater'--and 'scopel' stands for 'seeing' or 'viewing.'"

"Whew!" Bud gave an awed whistle. "Seeing a million times farther than ever before! Nice going, Tom!"

...

Both men watched with interest as Tom explained his small-scale pilot model. Besides the signal-generating equipment and amplifier, the device had a curious-looking antenna. It was composed of a series of wire rings connected together into a tubelike framework.

Arv Hanson looked puzzled when Tom called the setup an "anti-inverse-square-wave generator." "Say that again," he murmured, frowning.

Tom grinned. "Well, you've heard of the inverse-square law," he began. "It says that the strength of a signal is inversely proportional to the square of the distance from its source."

Using chalk and a blackboard, Tom dashed off a simple example. "If twenty units of light are received two feet away from an electric bulb, then only five units will be received at a distance of four feet," Tom explained.

"That's because light and other forms of energy travel in spreading waves so that you pick up only a smaller and smaller bit of the signal the farther away you are," Tom went on. "But I call my generator an *anti*-inverse-square type because the signal *doesn't* get weaker. It stays focused in a constant beam."

...

"Suppose we want to see the moon close up," he began. "We beam out two signals at the same instant--but with a tiny difference in wave length."

Tom wrote down his example. "One signal would have a wave length of say, 100 meters, the other of 100.0001 meters." He did some hasty arithmetic.

"As you can see, the waves will become more and more out of phase as they travel along though space. By the time they reach the moon, they'll be exactly 180 degrees out of phase--which means they cancel each other out. And this gives us our terminal point for scanning the moon's surface."

...

"You say you're goin' to get sky pictures with that thingamajig when it's all done?" Chow asked.

Tom nodded. "This is the last part of my space prober. It'll be sort of a radiation lens."

"Like on a camera?" Chow scowled and scratched his bald head in perplexity. "Brand my cactus salad, I thought lenses were made out o' glass!"

"That's right. I was just suing a figure out speech," Tom explained. "What I meant was, this will serve the same *purpose* as the lens of a camera or the objective lens of a telescope. Here, I'll show you."

Using chalk and a blackboard, Tom sketched a simple diagram of a camera to show Chow how the lens bent the light to form an image on the film. Then he diagrammed the way in which his prober would beam three radio waves out into space. Two of these would cancel out at wave terminal point--whatever distance the viewer wished to see.

"In other words, they give us our point of view," Tom said. "And the third wave signal acts as our lens. It picks up an 'image,' you might say, from the light rays reflected by the object we want to look at--and transmits the image back to our receive, so we can see it on a screen."

Chow circled cautiously around the workbench, squinting at the electronic apparatus from all angles.

"Where is this here 'third wave signal' you're talkin' about, boss?"

Tom smiled. "You won't be able to see any of the three waves that the prober beams out into space, Chow," he explained. "They're invisible, just like all radio signals."

"Well, I'll be jing-whistled!" Chow eyed the young inventor in amazement. "An invisible camera lens that makes pictures you can see! Tom, that's remarkable!"

How practical is it to build a MegascopE Space Prober? Not very practical, to say the least. The entire invention hangs on Tom's "anti-inverse-square-wave" -- a wave that defies everything known about physics by exceeding the speed of light and not diminishing over distance. I know of no bylaw that would permit such a wave to exist. Maybe Tom invented a machine that could send waves through the imaginary realm of hyperspace or maybe he found a way to easily generate exotic nuclear particles (such as neutrinos) that can exceed the speed of light. At any rate, with our current knowledge of physics, building a space prober is entirely out of the question.

However, it **might** be possible to build a MegascopE Space Prober that works with normal radio waves. Such a device, though, would be expensive, rather costly, and practically useless. After all, if the images aren't in color and aren't real-time why bother with all the expense? Ordinary light reflected from objects is good enough for most people.

What are the properties of Tom's "anti-inverse-square-wave"? The unique and mind-boggling wave that Tom invented has some interesting properties: it can exceed the speed of light; it is invisible; it can be generated fairly easily; it can be used to generate full-color real-time images of very distant objects; it does not cope very well with certain types of gases and radiation, and it does not diminish in power over long distances.

How did Tom use or market the MegascopE Space Prober? First of all, Tom had a space prober assembled and installed at Swift Enterprises. Secondly, he had one installed on his amazing spaceship *Challenger*, and it is highly likely that he put one on his *Cosmotron Express*. It does not appear, though, that Tom tried to market his prober in any way, despite the fact that the general public knew it existed and was excited about its capabilities. Proof of this, in fact, is in the book *Tom Swift and his Subocean Geotron*. In *Tom Swift and his Subocean Geotron*, Tom needs some scientists to study a strange spaceship that is hovering over the ocean, so he calls in some ecstatic scientist's to use his Prober (the only device that could get a really good view of the object) -- thus suggesting that he had the only one.

How much impact would a MegascopE Space Prober have on civilization? It would have a lot of impact in the field of astronomy and space exploration. The reasons are obvious: modern-day telescopes are not only limited to fairly large and bright objects, they also can't show real-time images of something. A telescope, then, that has infinite range, generates real-time images, is in true-color without computer

enhancement, and has superb resolution would be an astronomer's dream. Space probes to map out the surface of a distant planet would no longer be necessary -- simply warm up the prober and turn it on Pluto or Alpha Delta 9 and you have a perfect map, down to the pebbles in the sand.

It also might be possible to alter the beam of the prober so that it can give infrared (heat) information or spectral analysis of rocks. It might also be possible to change the wave of the prober so as to generate images of a planet's core, for example. If this is indeed the case, then scientists will be able to get *all* the information they need from a distant planet without leaving the comforts of the observatory.

The Megascoppe Space Prober would also be the last word in spy satellites. It would be a spy's dream -- you could, theoretically, have a from-orbit resolution that can see the finest grain of sand. Hook it up to a 3-D Telejector, and you've got a winning combination of fantastic resolution and 3-D images.



The second major invention listed in this book is Tom's **Private Ear** radio sets. The *Private Ear* is basically an eavesdrop-proof radio that, because it uses Tom's anti-inverse-square-wave, can break the light barrier and permit real-time communications between such far-away places as Earth and Pluto.

How does the Private Ear radio work? The book devotes a surprising amount of time to the development and explanation to the Private Ear radio sets. Here is some of what Tom had to say:

...He was eager to try out his plan for using the anti-inverse-square-wave principle in a new kind of radio.

Two separate receiver-transmitters would be needed for the experiment. The idea was so clear in Tom's head that he plunged into the job of constructing the units at once, with only rough preliminary sketches or circuit diagrams that he had already drawn.

"The radios can be very small and fairly low powered," Tom reasoned, "since they'll transmit on a very narrow beam of radiation."

Each would need a small computer in its base. Tom produced these quickly by converting two of his "Little Idiots"--amazing midget electronic brains that he had invented for his expedition to the phantom satellite.

...

The new radios, like his space telescope, had extremely sensitive amplifying circuits that would have to be supercooled by liquid helium. This meant that the circulating tubes and housing must withstand ultra high pressures.

"That'll make it tough to keep the sets very light in weight," Tom mused.

Suddenly the answer came to him. "Durastress! Why didn't I think of that before?" Durastress was a plastic he had invented that had fantastic properties---far stronger than any metal of comparable lightness. Tom had used it to contain the revolutionary atomic dynamo in his triphibian atomicar.

The plastic could be worked easily, and Tom soon had the radio housings and helium coils constructed. Next would come the job of installing the electronic circuitry and chassis.

...

What're these, Tom?" he inquired. "Your latest brain children?"

"Yes, and they're twins. I designed them for a special kind of radio communication which should be pretty useful in our space work."

"Well, don't keep me in suspense," Bud pleaded. "What's the angle?"

"With radios like these," Tom said, "we won't need to use a scrambling device for secrecy."

"How come?"

"Because *no one else in the world* can eavesdrop on our conversation."

Bud looked startled. "Are you kidding?"

"No, it's on the level," Tom replied. "Oh, it's barely possible that someone might poke his antenna exactly into the path of our two-way beam. But it's a zillion-to-one chance--and then we would have instant warning, because it would break our two-way contact."

Bud settled down on a stool again, his eyes glinting with interest. "Tell me more." Tom explained his anti-inverse-square-wave principle by which a radio signal could be transmitted any distance in a single, self-enclosed beam.

"When you first start broadcasting," Tom continued, "the radio will transmit in the usual fashion. But as soon as you make contact with the station you're calling, the anti-inverse-square-wave effect comes into play."

"By means of the computer in the base of each radio, the two sets would instantly 'lock' onto each other. From then on, the transmission would take place in a very narrow beam of radiation--with no other listeners able to tune in."

...

Tom proceeded to hook up a system of tubing from a helium cryostat to one of the radio sets.

"What's that for?" Bud asked.

"The amplifying circuits will be working with such delicate signals that they have to be bathed in liquid helium," Tom explained. "Otherwise, unless they're supercooled, the molecular motion sets up too much noise."

"Whew! I guess that's about as delicate as you can get, eh?"

Tom grinned. "After I get the set loaded with coolant, there's a small cryostatic compressor inside that will keep the helium liquefied whenever the radio is in operation. Sort of a midget-sized refrigerator."

How practical is it to build a Private Ear? As with the space prober, it really can't be done because you need a anti-inverse-square-wave, and such waves violate a great many laws of physics. However, it *might* be possible to build a Private Ear with normal radio waves. It would be quite difficult, as radio waves tend to scatter and a tight beam is needed for this job. A laser that works on radio frequencies would probably do the job nicely but it would undoubtedly prove to be very expensive, delicate, and power-hungry. It's still a fascinating idea, though...

How much impact would a Private Ear have? A good cheap Private Ear would completely take over the walkie-talkie and ham radio operator's market. After all, why settle for a walkie-talkie if you can get something just as cheap that cannot be spied on, transmits crystal-clear voice, and works real-time? I imagine that spies could find a few good uses for it as well...

Update! I recently received a note with some information regarding a real-life Private Ear radio. It looks like AT&T has developed something that is a lot like the private ear radio in the sense that you can't tap the communication channel. I believe that AT&T has demonstrated a protected channel using fiber optics for 1 to 2 kilometers. In TS's invention, since the communication occurs in a tight beam, the tapper would have to insert an antenna directly in the path of the beam (very, very unlikely) and this would immediately block the signal from continuing to the receiver. The closest I can think of this today is to use a very narrow laser beam. There would be some spreading but probably not enough to make detection likely.

For quantum cryptography, the tapper introduces extra randomness into the channel that can be detected at the endpoints.

It looks like Tom's invention might be more realistic than I had expected! Tom knew what he was doing after all.

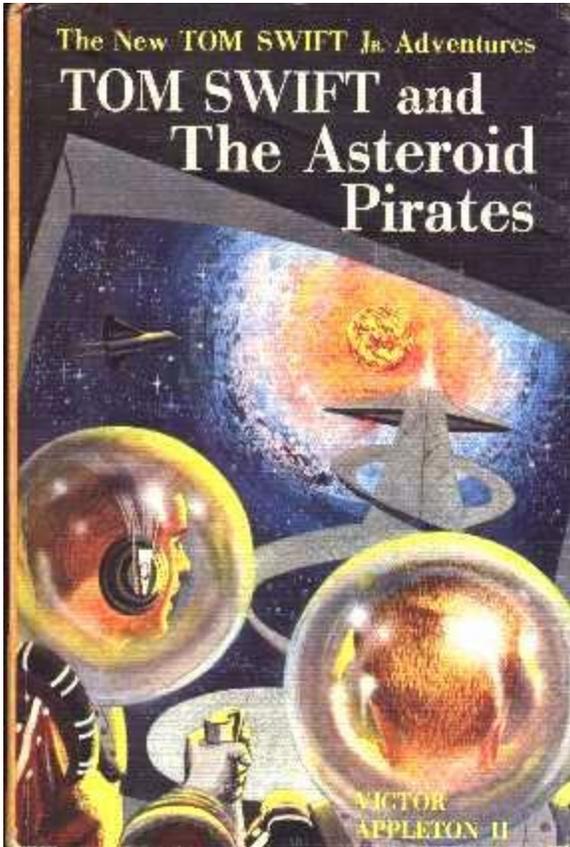
Minor Inventions: Tom's helium-extraction machine is the only minor invention in this book. At the time, of course, the invention was pretty big. For a great many years helium was more precious than gold.

In fact, a few hundred years ago helium was an unknown element, and it wasn't until this century that helium was found to exist on Earth. Today, of course, we can extract helium in pretty large quantities from the atmosphere, which is just what Tom's machine claimed to do. Does anybody know if Tom built his machine before today's helium extraction machines were developed? It would be interesting to see which came first...

A Last Note

In the book, Tom's cryostat goes haywire and the liquid helium crawls *upward* out of its container. This actually can happen. When helium becomes a liquid at around 4 degrees above absolute zero it turns into a superfluid. A superfluid is a fluid with some *remarkable* characteristics, one of which is indeed "spilling upward".

#21. Tom Swift and the Asteroid Pirates (1963)



Summary: Extracted from one of the title pages of the book:

A violent explosion in space touches off one of the most thrill-packed adventures in Tom Swift Jr.'s scientific career. The appalling news that a cargo rocket has disintegrated while en route with vital supplies to Swift Enterprises' research base on the asteroid, Nestria, sounds a grim warning that the lives of Nestria's personnel are at stake.

To rescue the marooned men, Tom undertakes a hazardous voyage to Nestria, only to find the way blocked by an invisible barrier of deadly radiation created by an unknown enemy whose objective is possession of the base.

Tension mounts at Swift Enterprises when a mysterious Oriental is shot while attempting to warn Tom that his life is in danger from the Black Cobra. The Oriental's mumbled warning, plus some revealing data collected by United States Intelligence, sends Tom winging to a secret fortress in South America for the first encounter with his inscrutable foe.

But the decisive encounter is destined to take place in space. How Tom uses his new invention, the magnetic deflector, to crack the radiation barrier around Nestria, and how the young space scientist and his crewmen pit their wits and courage against the asteroid pirates and their diabolical leader, the Black Cobra, will hold every reader breathless with suspense.

They were now in a high-vaulted, stone-flagged hall. But Tom and Bud had little time to look around. Their eyes were drawn at once to a strik-



ing figure who stepped from behind a huge desk to meet them.

Towering well over six feet, lithe and muscular



as a jungle cat, the man was clad in a sleek-fitting black uniform trimmed in gold braid. His head was shaven bald, except for a short queue of jet-black hair which dangled to one side. His eyes, green as twin agates, and faintly slanted, studied

Major Inventions

This book is a fine, normal Tom Swift book, except for one thing. There is one small (but easy to make) error in this book, and while I wouldn't call it a mistake, I would like to spend some time discussing it.

The odd point about this book is the field of antimatter particles that the Black Cobra (pictured above, to the left) put around Nestria (and it *was* a barrier of antimatter -- see page 119 for the proof). This could never, never have happened, for the simple reason that the field of antimatter would have completely obliterated the satellite, and possibly earth as well.

Why? Simply because matter and antimatter do *not* mix. If antimatter ever comes into contact with matter, they instantly annihilate themselves into a shower of gamma rays. In fact, according to some sources, a single gram of antimatter, properly spaced, could completely destroy the entire planet Earth. That's a lot of exploding power, and it means that, if a barrier of antimatter was put around Nestria, it would have annihilated the planet instantly if it had ever come into contact with the planet's atmosphere.

All right then, you might say, suppose the barrier didn't come into contact with the moon's atmosphere. There would still be problems. Remember how the enemy was able to get through the barrier by flipping a switch and dispelling the barrier? This would be the biggest mistake a person could make. Remember how explosive antimatter is? If you dispelled the barrier into space, you would, in effect, be scattering antimatter

atoms randomly outward, away from the planet. Plowing into even a small patch of antimatter would be both unavoidable -- and deadly.

And how did the Black Cobra control the moon's atmosphere? Supposedly he had a machine on the surface that would dispel the barrier, but how did he communicate with it? Radio is the answer given, but that *couldn't* have worked -- Tom tried desperately to communicate with the moon by radio, and he had a desperately hard time getting through.



But, let's suppose that the barrier didn't touch the moon's atmosphere. Let's also suppose that he had a way to control the barrier, a way to communicate with his machine, and a way to plow through the barrier (although that's a lot of supposing). This still leaves one more point -- namely, how did he keep the barrier from disintegrating? Space isn't a perfect vacuum, and doubtless every now and then a normal atom would wander into the field and annihilate itself into a shower of radiation. This must have happened a lot, too, because Tom could only get a scraggly reply through the barrier from the moon at certain times of night (and no reply at all during the day), when the field would have been at its least active point. This hints at a *lot* of activity in the barrier, which means that the barrier must have had to have been re-seeded every now and then. So how did the Black Cobra accomplish this? Maybe he went up once a week to Nestria and did the job, although this is highly unlikely.

All of this discussion ignores the fact that antimatter is extraordinarily difficult to create. In fact, it wasn't until 1997 that the first atom of antimatter -- an anti-hydrogen atom -- was created, and it only lasted for a few billionths of a second. How could the Cobra have created the enormous -- let me repeat myself, the *enormous* -- number of atoms that would have been needed to put a barrier around an entire moon? How did he ship the atoms into space? There are clearly some very grave scientific problems here, and while I won't say they aren't unfixable I will say that they make the whole deal pretty

far-fetched.

If you put aside your disbelief, however, the story is actually very imaginative: a group of scientists come together and decide to steal an asteroid by putting a field of antimatter around it, starving out its inhabitants, and then moving in. In my mind this is far more imaginative than having the base attacked by a fleet of enemy ships, or having the enemy invent some kind of new death-ray. Some thought went into this plot, and I appreciate it; despite its obvious and glaring scientific irregularities, this book is still one my personal favorites.

This book is one of the only books in the entire series in which Tom invented his invention to fulfill a need that he had. Usually (and book #22 is a good example) Tom Swift invented his invention, and then, out of the blue, he had a good use for it. This is not the case here, however.

Tom's one and only invention in this book is his **Magnetic Deflector**. (Do you see that spirally silver twisted thing on the cover of the book? That is the Magnetic Deflector.) The Magnetic Deflector has one and only one purpose -- to repel antimatter. It's pretty similar to Tom's repelatron, with the exception that the repelatron works with ordinary matter and the magnetic deflector works with antimatter.

How the Magnetic Deflector works: In the words of Tom Swift:

Now that the flurry had subsided, he stared at the strange-looking device on Tom's workbench. It appeared to be a heavy metal figure eight, with the top loop of the eight twisted at right angles to the bottom loop. A wire-wound rod protruded through the two loops. Two heavily insulated tubes connected this assembly to a large, boxlike console.

"What in tarnation do you call that thingamabob?" Chow said, venturing in to examine it.

"A magnetic deflector," Tom said. "I'm hoping it'll crack the radiation [read antimatter] barrier around Nestria. This is just a pilot model, of course."

As always, the loyal cowpoke was eager to hear more of his young boss's latest invention.

Tom explained that the figure eight contained an inner core of a special alloy, partly Lunite from Nestria. This was designed to carry a heavy flow of current in a bath of liquid helium.

"The helium chills the alloy so cold that it has no electrical resistance," Tom went on. "Once a current starts flowing through, it just keeps going with no further electrical input."

The current flow, he said, sets up an intense magnetic field in and around the probe output tube. This was the rod piercing the figure eight.

"Each time a voltage pulse is applied to the probe, it pushes that magnetic field right out of the rod--shoots it out, you might say."

"Like squirtin' toothpaste out of a tube?"

"Right. And that's what repels the antimatter particles to clear a safe path for the spaceship." Tom's eyes glinted. "In effect, it'll punch a hole right through the radiation barrier--at least that's what I'm hoping."

How feasible is it to build a Magnetic Deflector? Well, that's hard to say. The device really doesn't appear to have any theoretical problems. Its construction does hinge on that Lunite ore, although I imagine

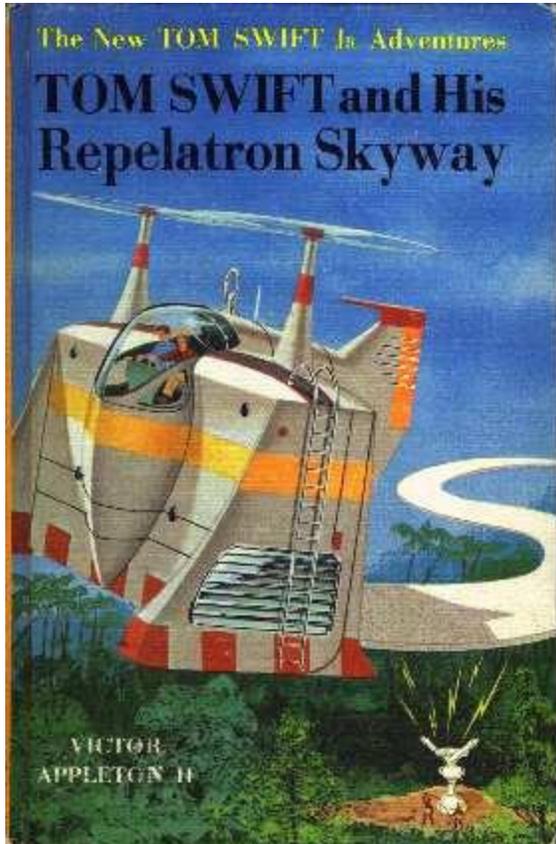
that a suitable (and perhaps better) substitute could be found. The real problem is the fact that this device has no place in modern life -- after all, who wants to punch a hole through a barrier of antimatter?

How much impact would a Magnetic Deflector have on civilization? It would have no impact at all on modern life, for the simple reason that there are no antimatter barriers to dispel!

A Parting Note

If you read the book immediately preceding this one (Tom Swift and His Megascoppe Space Prober), you will recall that, on the last page, Tom and Bud were asked to head an expedition to Venus. In the first paragraph of this book, however, a solar flare-up (and yes, such solar flare-ups do exist and happen) caused too much interstellar radiation and thus canceled the trip to Venus. It should be noted, however, that Tom did get around to going to Venus, although it took him 11 more books (he did it in the book Tom Swift and His Cosmotron Express) to get around to it.

#22. Tom Swift and His Repelatron Skyway (1963)



Summary: Extracted from one of the title pages of the book:

From the very moment that Tom Swift Jr. agrees to help the government of Ngombia build a highway to link the jungle-separated provinces of the new African nation - a task that has stumped the best engineers in the United States - he is beset by mysterious attacks aimed to defeat the project.

Construction of the road is urgent. At stake is the economic future of this friendly country. But no conventional highway will do. For existing engineering methods cannot be used to bridge the seething, bubbling swamp in the rain forest.

Tom comes up with an amazing scientific solution to the problem - an aerial highway over the jungle at treetop level, supported only by invisible repelatron beams.

Deep in the jungle, fantastic-sized creatures - throwbacks to the dinosaur age - and an eccentric scientist, missing for twenty years, add to the harassment's besetting the Swift work crews.

In a series of dangerous adventures, Tom must outmaneuver the sinister forces working against him and the Ngombian government, win the trust of the hostile scientist, and carry through the skyway to a successful conclusion.

Major Inventions

There are two main inventions in this book: the **Graphicopter** and the **Repelatron Skyway**. The Graphicopter, which is pictured on the book's cover, is basically a computer controlled helicopter that can be used for fire fighting, skywriting, pouring cement, or anything else that requires great precision and maneuverability. There really isn't very much to a Graphicopter, so I'll get on to the next invention.

The *Repelatron Skyway* is really what the entire book is about. Basically, Tom needs to find a way to quickly and cheaply lay a road through the dense jungles of Ngombia. Rather than hack his way through the jungle,

as most people would do, Tom adapts his amazing repelatron technology and creates a road that flies 200-300 feet above the jungle floor.



How does the Repelatron Skyway work? Basically, Tom took a normal highway, a bunch of repeltrons, and a lot of Durastress (a lightweight but strong material he invented for his Triphibian Atomicar), shook them all up, and came up with the Skyway. The idea behind the skyway is quite simple: instead of hacking a ground path, pouring cement, doing ground studies and erecting supports you merely make a few small clearings at half-mile intervals, set up a powerful repelatron in each clearing, and pour your road 200-300 feet above the ground. A few of Tom's comments from the book are:

"Dad, I've just figured how to lick our whole problem. Instead of running a road through the jungle, we'll build an aerial highway above the treetop level!"

Both Mr. Swift and Mr. Newton were astonished.

"I'm afraid that I don't follow you, son."

Tom went on enthusiastically, **"By running the highway above the trees, we can sidestep the mess of hacking a route through the jungle!"**

"Great, but how do you intend to support this aerial highway?" put in Uncle Ned. **"It certainly can't float in the air!"**

"That's just exactly what it *will* do," Tom explained. **"The roadway will be made of strong but featherweight material, supported in mid-air by repelatron beams - the same kind of repulsion rays used in my moon ship and atomicars!"**

Grabbing pencil and paper, Tom pushed back the luncheon dishes and began sketching out his idea. The rays to hold up the highway would be generated by repelatron transmitters, planted at widely spaced intervals. Installing these would be a much cheaper and easier job than building a continuous highway through the jungle.

...

Tom felt so confident that he plunged into work that afternoon on the job of inventing a suitable roadway material. He decided to use Durafoam - an air-celled adaptation of his amazing vacuum-celled Durabuoy plastic. This would be reinforced with fibers of Durastress, the fantastically strong and rigid material he had invented to contain his midget atomic dynamo.

...

"Here's the info on the repelatron transmitters for my aerial highway," Tom said, showing them some sketches. "The transmitters will be spaced at half-mile intervals. I'll need half a dozen built for my pilot test."

The transmitter units would stand about ten feet high. Each one had a bell-shaped base. From this, a column arose which flared into a fan-shaped opening at the top.

"Let's take it part by part," Tom said. "Down in this bell-shaped housing at the bottom is one of my midget atomic dynamos. It will generate the power for the transmitter."

Tom went on to explain that just above this, inside the column, was the electronic apparatus of the repelatron itself.

"The rays which support the highway," Tom continued, "will be beamed out through this fanlike opening at the top. They'll sweep back and forth thousands of times per second—spreading out in a wide enough arc to support a half-mile span of the highway."

"What about these tubes sticking out on each side of the unit?" Hank put in.

"They'll project rays to the right and left of the highway. And these rays will be reflected back toward the highway, so as to lock it rigidly in position and keep the span from swaying from side to side."

"How are the rays reflected?" Arv asked.

Tom produced another set of drawings. "By means of these twin-horned reflectors. They'll be bracketed to trees that have been trimmed."

The sweep beams, Tom concluded, would support the highway at an elevation of over two hundred feet - enough to clear the highest trees.

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Meanwhile, Tom went off to the hangar to convert one of his graphicoptors for the road-laying operation. The foam plastic would be pumped out through a road-width slot along the base of the copter's storage tank.

Chow, who had come in, watched Tom weld a part of the graphicopter assembly in place. He asked about the newfangled road layer.

"It'll squirt out the highway as if we were squeezing it out of a giant toothpaste tube," Tom explained.

"Brand my bridgework, that's plumb remarkable." Chow looked awed. "You ain't fixin' to squirt out the whole highway in one swoop?"

"No. The graphicoptor will only hold enough mix to lay about half a mile per load. But each section will bond automatically to the preceding span as the plastic hardens." Tom added, "I have two flying supply tanks on the drawing board - 'helitanks', you might call them - for refilling the graphicoptor in the air. They aren't built yet, so for my demonstration I'll refill from tank trucks on the ground."



How feasible is it to build a Repelatron Skyway?

Without the use of either the repelatron or antigravity I'm afraid there isn't a chance that a skyway could be built. There is just currently no practical way to get anything to float on air - unless you turn to helicopter blades and airfoils and jet engines, which are all highly impractical and expensive for highway use. Of course, if someone discovered the secret of antigravity, well, that would be another matter...

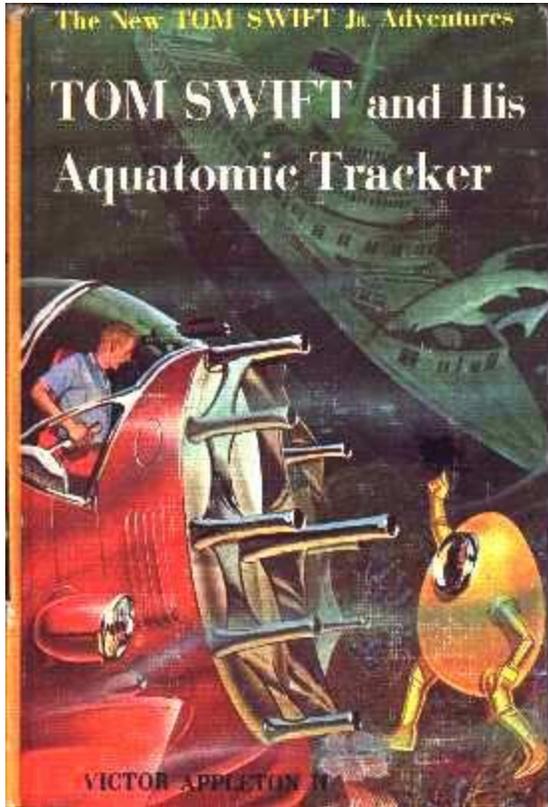
How useful would a Repelatron Skyway be?

A skyway could have a great many potential uses. Bridges could be built over water of any depth or distance using this technology - hey, you could build a bridge from California to Hawaii or from Washington to London in a matter of months. Safety would be vastly improved as well as the stability or instability of the ground or local surroundings would not matter anymore. (Think: a repelatron is designed to repel things. If the repeltrons are mounted underneath the road and are set to repel the ground they will do so - and whether the ground moves

or is still makes absolutely no difference.)

Highways would also tremendously benefit from this technology. It currently takes years of work to design and build a highway - but you could build a skyway in mere weeks. If the transmitters were mounted on the underside of the road you wouldn't need to bother with what the local terrain looked like - you simply mount your transmitters on your road, put your road in place, and there you have it. Roads, then, could cheaply and quickly be built to fantastically hard-to-reach places. In fact, you just might be able to build a road from Earth to the Moon - although what practical use that road could be I really don't know.

#23. Tom Swift and His Aquatomic Tracker (1964)



Summary: Extracted from one of the title pages of the book:

Tom Swift and his pal Bud Barclay embark on one of the greatest scientific adventures of the century -- a daring underwater crossing of the Atlantic Ocean, equipped only with Tom's electronic hydrolung suits! Hundreds of miles from land, the hydrolung batteries inexplicably go dead and the two boys are dramatically rescued in the dark of night. Examination of their equipment reveals sabotage.

A complex clue leads Tom to believe there is a connection between the sabotaging of the hydrolung and the sinking of the SS Centurion--which went down in mid-Atlantic with a fortune in gold bullion and a world-famous statue aboard. After making good on their second attempt to accomplish the nonstop swim under the Atlantic, Tom and Bud are given the assignment of salvaging the Centurion's valuable cargo. To locate the sunken ship, Tom designs the aquatomic tracker, an astounding device that detects and identifies metallic and chemical traces left by an object in water, then tracks the object.

How the young scientist-inventor outwits the vicious saboteurs and traps the most fiendishly clever mastermind of crime he has ever met makes a fast-moving story of super-suspense.

First, before you begin...

The following is a book report on *Tom Swift and his Aquatomic Tracker*. It was written and forwarded to me by Sayre Jeannet, who explains:

I wrote this summary because I had to write a report on a book that I read. I thought it would be more fun if I did one on a Tom Swift book instead of a normal book. Here it is I hope you enjoy it.

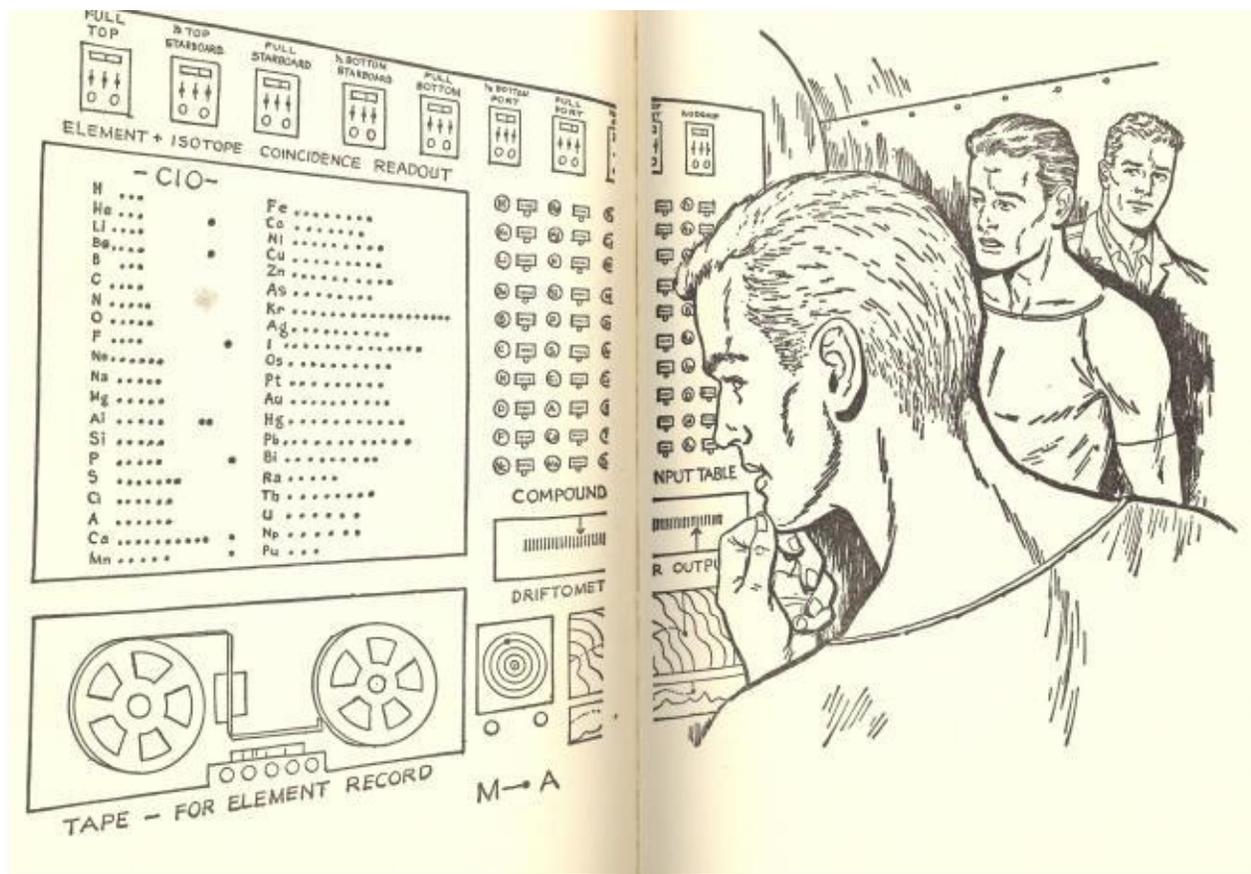
PUBLISHED IN THE YEAR 1964, TOM SWIFT AND HIS AQUATOMIC TRACKER IS AUTHORED BY VICTOR APPLETON II. THIS SCIENCE FICTION BOOK, WHICH HAS THE SUSPENSE OF A MYSTERY NOVEL, IS ABOUT TOM SWIFT Jr. AND HIS BEST FRIEND BUD BARCLAY. UNDERTAKING A DANGEROUSLY

SIGNIFICANT MISSION TOM MUST SALVAGE THE GOLD BULLION OFF THE S.S. CENTURION, WHICH HAD SUNK IN THE ATLANTIC OCEAN. HE MUST WORK SPEEDILY IF THIS MISSION IS TO SUCCEED. BECAUSE TOM HAS TO FIND A SUNKENSHIP, HE DECIDES TO USE HIS INVENTION, THE BLOODHOUND OF THE DEEP, THE AQUATOMIC TRACKER. BUT, ENEMIES ARE LURKING JUST AROUND THE CORNER.

AFTER ARRIVING IN ENGLAND FROM AN UNDERSEA VOYAGE, WHICH HAD HAD LIFE THREATENING MISHAPS, WHERE TOM WAS TESTING ONE OF HIS NEW INVENTIONS, THE HYDROLUNG SUIT, TOM IS ASKED TO RECOVER THE GOLD BARS OFF THE CENTURION. HUNGRILY, TOM AND SOME OF HIS FRIENDS WERE EATING AT A RESTAURANT WHEN SOMEONE TRIES TO STEAL THE BLUEPRINTS OF THE AQUATOMIC TRACKER! THE VILLAINOUS BULGARIANS SEND A HIRED MAN TO TRY AND GET TOM TO LOOK AT SIMILAR BLUEPRINTS BECAUSE THEY WANT TO SAY TOM COPIED THEIR IDEA. BUT THEIR PLANS ARE FOILED WHEN TOM DELIBERATELY REFUSES. NOT GIVING UP EASILY, THE CLEVER BULGARIANS HAVE MORE SCHEMES PLANNED. HIRED VILLAINS, STOLEN GOODS, KIDNAPPING, AND EVEN ATTEMPTS TO MURDER ARE JUST A FEW OF THE MANY THINGS IN STORE FOR TOM AND BUD AS THEY TRY TO RECOVER THE GOLD. THE RACE IS ON. WHO WILL GET TO THE BULLION FIRST?

BARELY ESCAPING WITH HIS LIFE, TOM GETS AWAY, BUT BUD, STILL HELD PRISONER ON THE SHIP, FEARLESSLY WAITS FOR HIS RESCUE, WHICH MAY OR MAY NOT COME IN TIME. GOING IN TO SAVE BUD, TOM FINDS THE SHIP DESERTED AND BUD GONE! TOM KNOWING THAT HE MUST LURE IN THE VILLAINS PUTS OUT BAIT THAT THE BULGARIANS CAN'T RESIST BECAUSE OF THEIR GREED. WILL TOM SUCCEED IN LURING THE BULGARIANS IN? WILL BUD BE RESCUED ALIVE? WILL TOM BE ABLE TO FIND THE GOLD WITH THE AQUATOMIC TRACKER? HOW WILL THEY CATCH THE VILLAINS? WANT THE ANSWERS? WELL, THE ANSWERS ARE IN EVERY PAGE OF THIS THRILLER.

TOM SWIFT AND HIS AQUATOMIC TRACKER PUTS YOUR STOMACH IN KNOTS BECAUSE OF THE SUSPENSE, THE EXCITEMENT, AND THE THRILL OF ENVISIONING TOM'S UNIQUE INVENTIONS AT WORK. THIS IS A STORY THAT EVERYONE HAS TO IT READ AT LEAST ONCE AND PROBABLY TWICE TO BE SATISFIED.



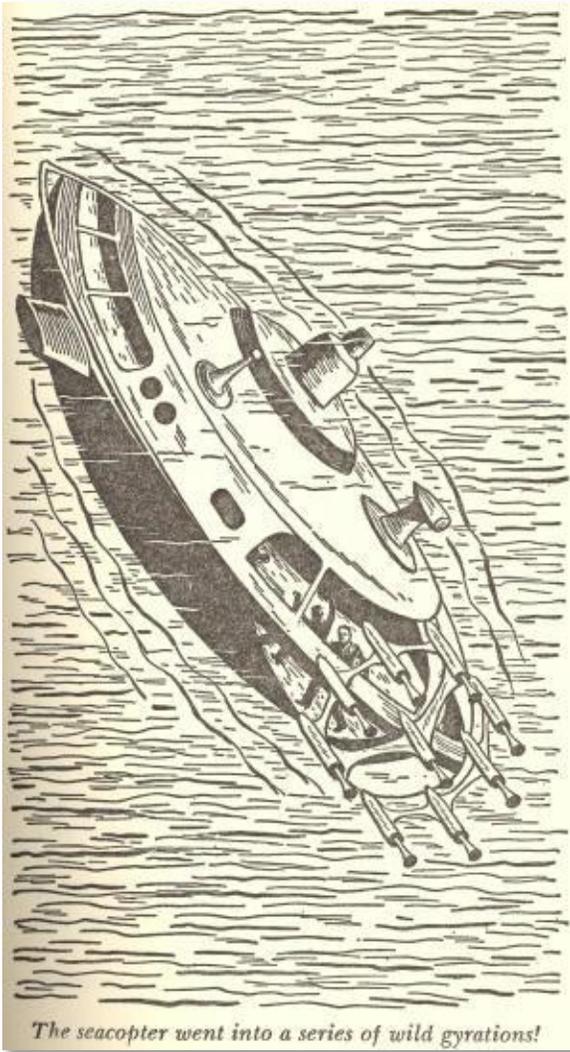
Major Inventions

The major invention in this book is the **Aquatomic Tracker**. The aquatomic tracker is, in Bud's words, a "sea bloodhound", capable of tracking a ship by the chemical residue it leaves behind in seawater.

How the Tracker works: In the words of Tom Swift:

"The seacopter had been brought to an airfield hangar for the installation job. Nine long, bellflared horns projected around the nose of the craft. These, Tom explained, were his repello-spectrograph detectors, or RSG units, with built-in driftometers.

"They'll sample the sea water from nine different directions around the ship," Tom said. "A computer inside, called a coincidence analyzer or CO-AN, will spot any particles of matter which show up evenly among the samples. It will also figure the direction in which to find the greatest concentration of those particles, after allowing for current drift."



"...The foreign particles spotted by the CO-AN will show up as flashing lights on this readout panel," Tom went on. "I'll pick out whichever ones we want to follow, and then tune in those same elements on this TC, or trail constructor."

"Like saying 'Follow that taxi' to your undersea driver, eh?" Bud quipped.

"Right. Now those orders are fed to a compound trace synthesizer or CTS. It compares them with the signals it's receiving from CO-AN -- and figures out what course must be steered to keep the two sets of data matched up."

"And the CTS outputs to the scopes? Hank asked.

"Yes, they're our visual guides if we want to steer manually," Tom replied. "On this first scope, a luminous dotted line will show the compass course of the object we're tracking. This second scope is a depth chart, to show its upward or downward course. And a dot will center on this cross-hair scope if we steer on the beam.

"How about those two marker arrows on the driftometer output dial?" Arv put in.

"We align them to compensate for any current."

How does the computer analyze water samples? From what I could tell, Tom uses a repelatron (see *Tom Swift and his Deep-Sea Hydrodome* for information on repelatrons) to separate the sample into its basic elements.

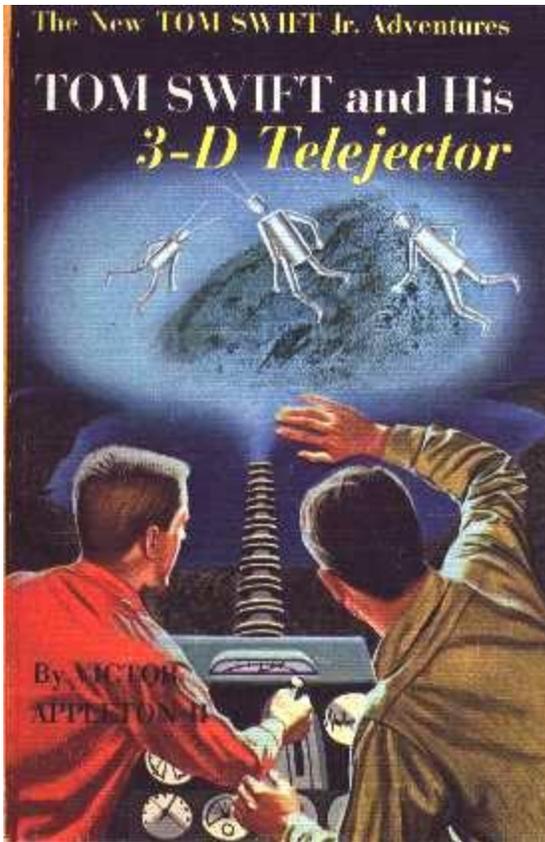
How feasible is it to build an Aquatomic Tracker? In theory it works out quite well, but when you get down to technical details it can quickly prove impractical. I mean, think about it: you would have to design a system that can, in real time, analyze a water sample, compare it to what you are tracking, and adjust your course to follow what you want. It would be possible, maybe, but enormously difficult.

Still, there are no physical laws that prevent a *Tracker* from being built. Physicists can, after all, extensively analyze samples of just about anything and tell you what they're made of. They can even notice some particles down to a part per billion, and in some cases a part per trillion. The trick, then, is not analyzing the sample -- it's analyzing the sample instantaneously, getting the data together, analyzing it, and making a judgment based on the data.

Can it be done? Possibly, if there was a demand for it. The first few prototypes would undoubtedly be primitive, but as time went on the technology would improve. The real problem here, however, is in the why of the matter. Why build one? Until this question is answered, I find it doubtful that a Tracker will ever be built.

How much impact would an Aquatomic Tracker have on civilization? Not a whole lot, really. Salvage operators, of course, could probably use one to track and salvage ships that have sank, and the military might want a few to track enemy subs as well (after all, it could even find subs impervious to radar). Scientists who study the ocean could probably put a few to use in tracking mineral concentrations in the Pacific, or maybe for charting gulf streams. Fishermen might even be able to use them to track the migration routes of fish. Outside of that, though, I can't think of anything.

#24. Tom Swift and his 3-D Telejector (1964)



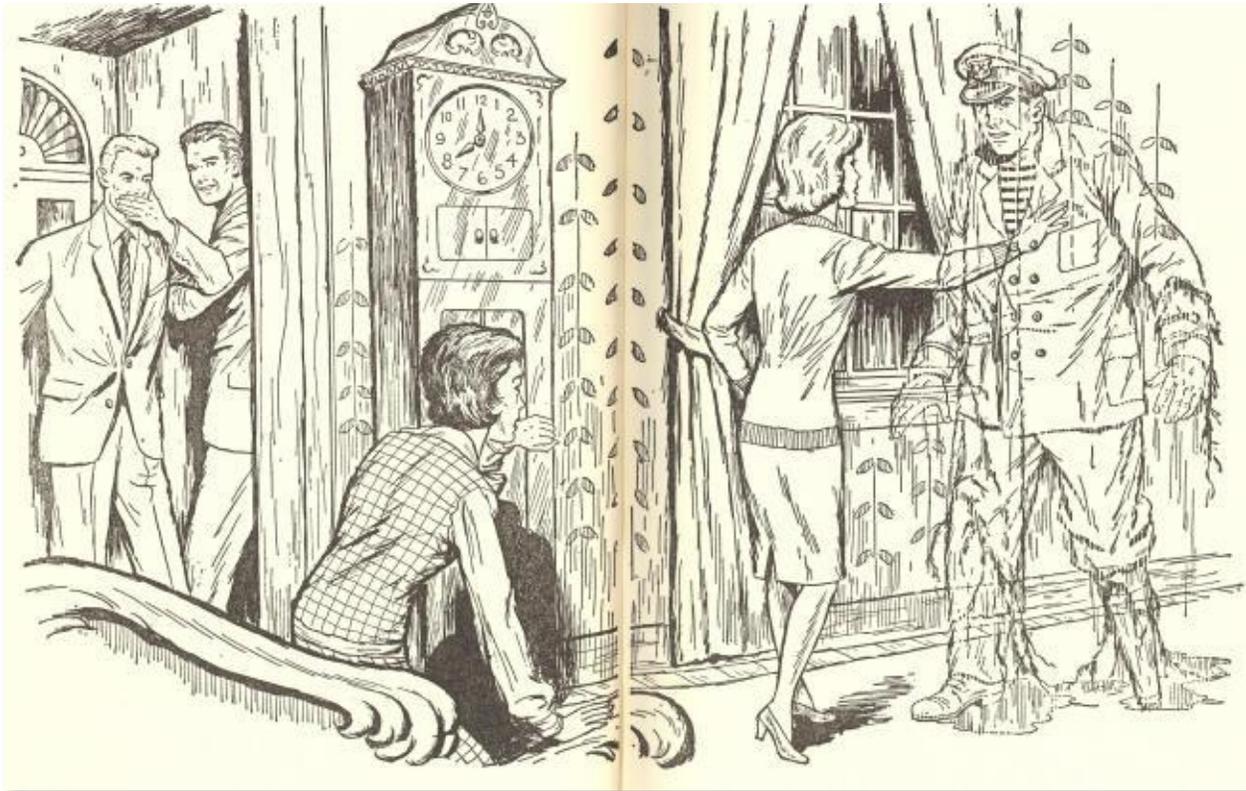
Summary: Extracted from one of the title pages of the book:

A weird green object has appeared in outer space! The United States Government requests Tom Swift Jr. to investigate this menace to earth's radio communications and threat to national security. But the Orb exerts an electromagnetic power that endangers Tom's spaceship and he is forced to return to earth.

Since it is impossible to land men, Tom designs robot astronauts, equipped with his new three-dimensional TV cameras as "eyes", to probe the Orb. While working feverishly to perfect his Video Viking robots, the young inventor discovers that the Orb has succeeded in communicating its hostility to a ruthless scientific group on earth and has ordered the leader of Q to destroy Swift Enterprises.

After vanquishing his earth enemies, Tom launches his robots. The startling three-dimensional images of an unheard-of phenomenon that the Video Vikings send back during their probe of the Orb result in Tom's making another attempt at a manned landing.

The dramatic showdown with the master brain of the Green Orb climaxes one of the most daring space exploits in the young scientist-inventor's thrilling career.



Major Inventions

The major invention in this book is, as the name implies, the **3-D Telejector**. The 3-D Telejector is simply a machine that can project beautiful life-size three-dimensional seemingly solid images into empty space using beams of light.

How does the 3-D Telejector work? In the words of Tom Swift:

"...how do you get the image to form at one place?"

"By using the same wave-terminal principle I used in my megascope space prober," Tom explained, referring to his electronic telescope of potentially infinite range. "That is, the telejector beams out two waves of slightly different frequency--and by varying the difference, I can adjust the range at which they'll be exactly 180 degrees out of phase."

"And the waves cancel out at that point?"

"Right. That point, or node, is called the wave-terminal point. Now then," Tom went on, "the telejector also beams out a picture signal. Part of the signal passes through the

terminal point as waste energy. Another part is reflected back from the terminal point to the transmitter."

"That's the part you use in your space prober to make the picture on the screen?" But asked.

Tom nodded. "Yes--but in the telejector, I use the third part of the signal. This part is absorbed right at the terminal point, and the energy causes the chemical mist to glow."

"Giving you a single spot of light?"

"Exactly," Tom said. "Then, as the telejector scans, it forms a complete three-dimensional image out of many such spots of light."

Later, of course, Tom manages to get an image without the mist, although exactly how he did it was never said.

How feasible is it to build a 3-D Telejector? From the way I understand it, it's practically impossible. The Telejector depends upon a new kind of radio wave that Tom invented for his Megascopce Space Prober. This radio wave has very unique properties -- besides going far faster than light, it can continue on forever without losing any power. Tom calls it an anti-inverse square law wave, which is a fancy way of saying that the wave ignores the inverse square law, which just happens to be one of the most fundamental laws in all of physics.

Today's holograms, however, are a step in the right direction. It is possible to create holograms of such quality that they are impossible to distinguish from the real object. Today's holographic technology, however, cannot take pictures of moving objects, is expensive, is inflexible, is delicate, is difficult to set up, requires a lot of equipment, and cannot be done solely through electronics (i.e. a photography plate -- film, in other words -- is needed). It's the last objection -- that holograms cannot be done solely electronically -- that is really holography's biggest drawback. Think about it: if holography requires chemicals, it can only show recorded scenes, and thus cannot be used for real-time imaging (as would be needed for TV sets and computer monitors).

Still, it's a step in the right direction. We've got a very long way to go, however, before holograms achieve anywhere near the immense usefulness of Tom Swift's Telejector.

How much impact would a 3-D Telejector have on civilization? The telejector would definitely have an *enormous* influence that reaches far beyond simple 3D television sets. For example, the telejector, since it can generate *life-size* images, can be used in many ways as a replacement for virtual reality. NASA, for example, could model a space station or spacecraft via computer and then beam it into empty space with a Telejector to see how the design looks -- no expensive virtual reality equipment needed. Architects could model the layouts of buildings. Engineers could model bridges.

The telejector would also have enormous uses in the computer field. Imagine what it would be like to have a telejector as a computer monitor! Size wouldn't matter anymore -- the screen could be as big as the room, if you liked, at no extra charge. Flight simulators and other 3D programs would take on a whole new level of reality. Engineers would be able to see in all three glorious dimensions what they were designing. Mapmakers and geologists would be able to see the actual terrain -- down to the ants, if needed -- they were dealing with.

Another potential use for this is for analyzing events after they happened. Normal video recording can only record one angle of a scene at a time, but a telejector-recorder could capture all angles at once and then re-play them at leisure. The Defense department might find this highly useful, as they could record battles and battlefields and then re-play them and study them in all their complexity. No longer would they have to agonizingly analyze photographs, eyewitness reports and computer-generated scenarios -- just take a snapshot with the Telejector and then you can re-build whatever you photographed -- in three dimensions -- in a nearly limitless resolution.

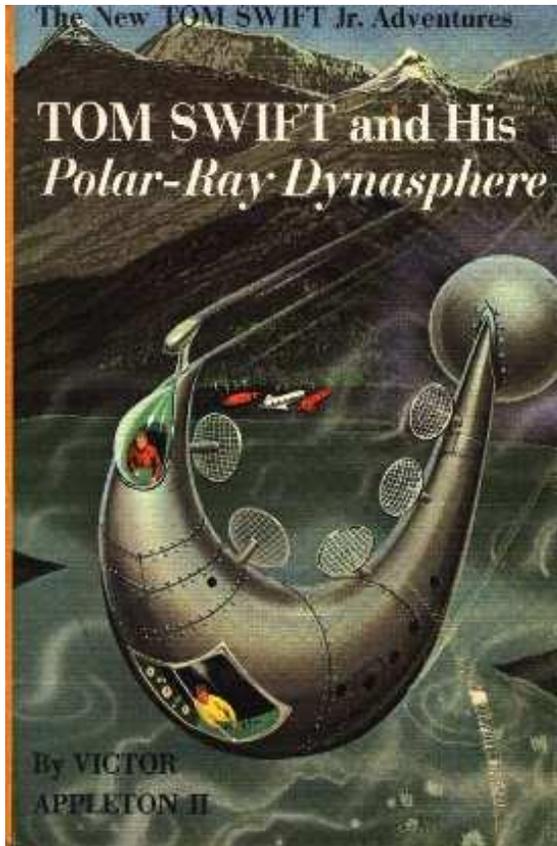
The police department might find this invention useful for prosecuting criminals. Why? Simple: they can set up a telejector-recorder in all department stores, and if anything happens they can reconstruct a perfect image -- down to the fingerprints of his fingers -- of the criminal.

In the book, Tom Swift recorded a 3D movie of Chow cooking lunch, despite the fact that he was on the other side of the wall. He did this by using a special camera that his father had invented that can see through walls. This, of course, would hugely expand the uses for a telejector. Doctors could record 3-D images of your veins or blood cells and then blow the images up to the size of a room. Expensive CAT scanners would no longer be needed. X-ray machines would be a thing of the past -- not only would the telejector not use harmful X-rays but the Telejector's images would be in three dimensions and could be scaled up to whatever scale you desired. (Try doing *that* with an X-ray!)

Imagine the espionage jobs you could do with one of these cameras! One could observe an enemy country while sitting thousands of miles away, and thus create enormous security problems. The camera could also be handy for space exploration. After all, why send space probes millions of miles to map out the surface of a planet when your good old megascope/telejector-recorder team can do the job right here on Earth?

Minor Inventions: The only other real invention in this book are the **Video Vikings**, which are basically cybernetic space probes modeled after robots, and other than the obvious "how in the world did he fit all the equipment in them?" there really isn't very much to say about them.

#25. Tom Swift and His Polar-Ray Dynasphere (1965)



Summary: Extracted from one of the title pages of the book:

An unidentified rocket ship crashes into the Swifts' outpost in space and vanished before Tom can track it down.

Shortly after comes the startling news that a Mars probe rocket, vital to the United States space program, has failed to respond to signals to bring it back to earth. Tom is confident that with his latest invention -- the Polar-Ray Dynasphere -- he can retrieve the stranded missile. But a web of espionage threatens his plan. A clue to the solution of the mystery prompts Tom to accept an invitation from the young Prince Jahan to visit his native land of Vishnapur in the snow-peaked Himalayas north of India.

In this remote Oriental kingdom, Tom and his pal Bud Barclay visit a strange lake of death and sight the tracks of a weird monster said to prowl the lake at night. Tom conceives an ingenious plan for draining the poison lake with the Dynasphere mounted aboard his new spacecraft, the Dyna Ranger, so that the valley may be turned into valuable farmland.

Fireball missiles and a hairbreadth encounter with a charging tiger are only two of the perils that confront the daring young inventor in this colorful, thrill-packed adventure.

Major Inventions

The main invention in this book is the **Polar-Ray Dynasphere**. The Dynasphere, which has to be one of Tom Swift's most far-out inventions, was built by Tom simply to retrieve an errant space probe sent to Mars by the Government. It seems that the government hadn't learned its lesson from their Jupiter Probe missile (see *Tom Swift and his Electric Hydrolung*) and had sent out yet another space probe devoid of radio gear. This time they weren't as lucky as they were with their Jupiter probe and the Mars probe missile got stuck in an orbit around Mars. The government thus wanted Tom Swift to invent a way to bring it back to Earth, and Tom, being Tom, obliged.

How does the Dynasphere work? The book, understandably, does not give out any hard data on how the Dynasphere was suppose to work. Still, the book did devote a good bit of text to the makings and uses of Tom's new invention. Here is some of what was said:



A device stood on the bench in front of Tom. It consisted of a round plastic base with slender brass rods sticking up to support two spheres of quartz crystal, one inside the other. Two coils were mounted, one above and one below the crystal globes. From the lower coil, wires were connected to various points on the outer sphere. A thick cable led from the base to a portable electronic console.

"Ah! It will be most rewarding to see the latest invention of the famous Tom Swift Jr.!" said a thick-haired student named Rakshi.

"This isn't an invention yet," Tom said. "I just rigged it up to carry out some experiments in the area of electromagnetic radiation." He explained that he had constructed the device to control and change the shape of electrical fields.

"This is done by the anti-inverse-square-wave technique I developed in making my megascope space prober." Tom said that the technique could focus waves into a beam of constant signal strength, instead of allowing them to radiate outward in all directions.

"Now, I'll demonstrate it," said Tom.

A number of electroscopes were placed about the room. These were glass jars, each with a metal rod passing through its sulfur stopper. Every rod had a metal ball on top and two thin gold leaves hanging at the bottom inside the jar. Tom took a plastic wand with a metal ball on one end and put an electric charge on the ball by touching it to a high-voltage terminal.

"Of course you all know what will happen when I bring this near the electroscopes," he said.

Tom held the wand near the ball of each electroscope in turn. In every one, the gold leaves swung apart as they became similarly charged and repelled each other.

"As you see, the ball has to be very close to the electroscopes because its field is so weak. But now watch what happens when I place the ball inside my field distorter."

Tom separated the crystal globes and inserted the metal ball. Then he twirled several tuning knobs on the console. As he aimed the globes at each electroscope, its leaves swung open!

"Amazing!" Prince Jahan murmured. "Your device has focused and beamed the ball's electrostatic field as far as ten yards."

"Yes, and with a more powerful machine, the range can be almost unlimited," Tom said. He now showed the model he had taken to the space outpost. Its inner sphere contained a mixture of helium, neon, and argon gases and was plated with silvery metal strips. As Tom switched it on, the gas glowed with a bluish-red radiance.

"This model produces its own field, so there's no need to insert a charged object. The inner sphere can be rotated on any axis, making it unnecessary for me to aim the device by hand."

Tom explained that by shaping the electric field into parabolic form, he could make use of its ability to reflect electromagnetic radiation and have it serve as an antenna.

The young inventor demonstrated this by turning on a portable TV set. He tuned his device to the proper frequency and the screen promptly went black. When Tom turned off his device, the picture appeared again as clearly as ever.

A student spoke up. "The electric field drew in the whole picture signal so that none was picked up by the TV antenna -- is that it?"

"Right," Tom said. "And now for an even more interesting experiment. As you know, white light is made up of a whole spectrum of colors -- red, yellow, green, blue, and violet. I'll tune the field to trap light waves of the frequency green -- and watch what happens to the overhead lights."

Everyone stared upward. The lights began to darken and take on a reddish-purple hue. Suddenly they went out completely! Even the daylight flooding in through the windows faded. In a moment the room was plunged into pitch-blackness except for the glow from the sphere!

"Hey!" Bud cried. "What's happening?" An alarm siren shrilled across the plant grounds.

Tom worked frantically to correct the trouble as the room filled with the smell of burning insulation. Full light was finally restored.

"I'm afraid my experiment misfired. Instead of trapping light of one wave length, the field pulled in a wide band of frequencies -- the whole visible spectrum."

"And in doing so blacked out the whole plant?" Rakshi asked with a supercilious smile.

"Yes, my device absorbed so much energy it burnt out the control circuits," Tom admitted...

...

Next day the young inventor plunged into work on his idea for retrieving objects in space. Bud dropped by the laboratory to watch the experiment. Tom was just switching off a vacuum pump connected to a thick-walled glass chamber. Inside the airless chamber, a metal-plated Ping-Pong ball hung from a nylon cord.

"What's this--a new game?" Bud asked.

Tom chuckled. "No, a demonstration of how I hope to bring back that Mars probe rocket."

Hmmm. Give me the low-down, Prof."

"Well, lets pretend that the Ping-Pong ball is the rocket," Tom began. He switched on his newly repaired electrostatic-field device and trained the inner crystal globe toward the glass chamber.

Instantly the ball swung toward Tom!

"Say, that's neat, boy. How does it work--by magnetic attraction?"

"No, you might say it turns the ping-pong ball into an electron-drive engine." When Bud looked blank, Tom explained that the field beamed out by his device, in effect, polarized the ping-pong ball, making its front side highly positive.

"Sort of a polar-ray beam, eh?"

"You could call it that, I guess. Anyhow, the electrons in the metal coating, being negative, are driven toward the rear side. And since the ball is in a vacuum, the electrons jet out freely at high velocity."

"I get it!!" Bud exclaimed. "The ball is driven forward by reaction--just like a jet-propelled plane of a rocket!"

"Exactly," Tom said with a nod. "And if I can beam out a powerful enough field--"...

...

Early Monday morning he flew to Fearing with Bud, eager to see his creation. Viewed from the side, the new spaceship looked like a fat, tilted crescent moon -- its horns pointing up and back. The lower horn extended far aft to form the tail of the craft, with a huge crystal sphere mounted at the stern. Atop the upper horn was a bubble-observation dome, while the pilot's window looked out from the forward bulge of the crescent.

"She's a beauty, Tom!" Bud commented. He pointed to several dish-shaped antennas mounted on the ship's "spine" along the inner curve of the crescent. "These are the repelatron catchers?"

"That's right. And the rocket -- or whatever other space object is retrieved -- will be held right here, inside the fuselage, with the magnetic grapples to keep it in place.

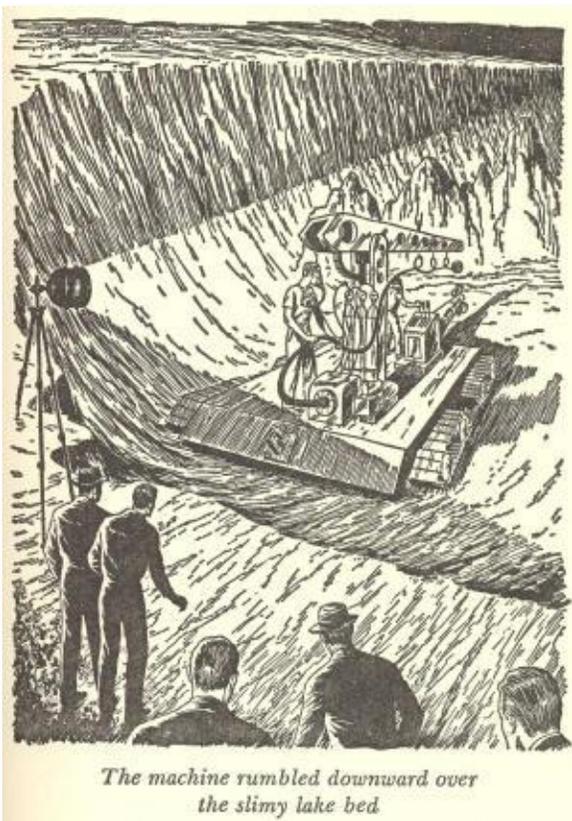
"Got a name for her yet?"

Tom smiled. "Well, as you know, that double-walled crystal sphere at the stern is my electrostatic-field device. I've decided to call the gadget a 'Dynasphere' -- or 'Polar-Ray Dynasphere,' thanks to you, pal. Remember you used the term 'polar-ray beam' when I was demonstrating this device?"

Bud was enthusiastic. "It's a real dream ship, skipper! ...Did you say you're going to turn it over to the government after you retrieve the Mars rocket?"

"Yes, Bud. It'll be used for salvaging dead satellites and other space junk."

They climbed to the observation dome and Tom began setting a row of dials on the Dynasphere's control console. He explained to Bud that he was feeding their orbital position and that of the satellite into a sighting computer. "That will automatically aim the electrostatic field."



The machine rumbled downward over the slimy lake bed

One of the minor problems Tom Swift had with this invention (he always seems to have minor problems!) was the pulse problem. It seemed that the invention of his sent out the electromagnetic field in "squirts" instead of a steady stream. Tom managed to fix it, of course (I believe he jiggled with the oscillator or something), but the whole situation does bring up some interesting questions. Why, for example, would he have that problem? Was he emitting some sort of a beam or ray that caused an electromagnetic field? And how does this fit in with his initial claim that the machine "absorbed" radiation?

And one last note: if you turn to page 133 of this book, you will notice that Tom Swift wore a spacesuit while inside the Dynasphere. It seems that, whenever inside one of his spacecraft, Tom Swift always wore a spacesuit. Why did he always do this? Couldn't he design a life support system adequately enough so that he could forgo spacesuits? The whole matter always struck me as odd. Just who, exactly, was responsible for this oversight? Perhaps the code for science fiction books of the 60's demanded people wear spacesuits even if they were inside a spacecraft. If so, this was an awfully shortsighted

code -- the men in the Space Shuttle and Mir, after all, go about their daily business in everyday, normal clothes.

What were students from Vishnapur doing at Swift Enterprise anyway? Well, it seems that Swift Enterprises had its own "foreign aid" program. Their idea was very simple: a group of people from a small, neglected, third world, underdeveloped nation were brought to Swift Enterprises to train in different scientific fields in hopes they could return to their native countries and modernize things and "raise their living standards". There is no clue as to how effective this policy was, but it was an interesting idea, at any rate.

One interesting thing to note about this was that Swift Enterprises had done work in underdeveloped countries before. Kabulistan (see *Tom Swift and his Triphibian Atomicar*), for example, was helped enormously from help given by Asa Provard and Swift Enterprises -- factories were built, schools were erected, and power plants were built. Tom Swift also did his bit in Africa, when he built his amazing Repelatron Skyway (see book #22).

Just what was Tom Swift Sr. doing with his bionics experiments? This book very casually lets drop the fact that Tom Swift is working on some "bionics" experiments. For those of you who don't know, the field of bionics busies itself with trying to enhance biological life by implanting man-made machines that can be implanted into living things and used by the organism as if they were part of him. A good example of a bionic piece of equipment would be an artificial eye that was capable of giving a completely blind person sight.

The question that comes up is "What is Tom Swift Sr. doing in bionics"? What was he trying to do? I, for one, have absolutely no idea. Maybe, just maybe, the author slipped that into the book to see if anyone would notice...

What different uses did Tom imagine the Dynasphere doing? Usually Tom Swift devotes extremely little space to uses his amazing inventions could provide. This time, however, he does manage to think up of a couple. Among them:

"...A little. I was using my new gadget as a wave trap or antenna to capture light of a single wave length from certain stars so I could study their red shift."

"Red shift?" Bud winked at Ken. "What's that -- a new Russian football play?"

Tom chuckled. "No, a shift in wave length tells us whether a star is moving toward or away from the sun."

One of the things Tom had his Dynasphere do was drain Lake Kali. It seems that Vishnapur had a highly poisonous lake situated on some highly valuable farmland. After some calculations and some badgering to the Vishnapurian government, it was decided to allow Tom to drain the lake, which he did. Here is how he did it:

"You still have not told us, Tom," Jahan said eagerly, "what you meant by a giant burning lens that works on electromagnetic principles."

"Remember the electrostatic field device that I demonstrated?" Tom replied. "I told you the field can be shaped to serve as a reflector for electromagnetic radiation. Well, by lofting my device into the sun--and by shaping the field with just the right amount of curvature--I'm sure I can beam down enough infrared radiation to vaporize the whole lake."

"Bud, Swift Sahib, the lake is large," said a student named Tundup. "To evaporate o much water would take vast amounts of energy."

Tom began to jot down some quick calculations. "Let's take five hundred watts per square centimeter as the power density I will focus on the lake surface. Now then, assuming the volume of the water in the lake to be..."

In a few moments Tom had the answer. "By a conservative estimate, I should be able to boil away all the water in about six hours."

...

"But will not more water be welling up all the time from the underground river?"

"Not if I plug the inlet first," Tom replied quietly. "After the water has been vaporized, I can clean out all the poisonous sediment and plant growth with a machine of mine called a Spectromarine selector. Then I'll remove the plug and allow the lake basin to fill up again - with pure, fresh water."

...

"How high are we going, skipper?" Bud asked.

"Just high enough for a good angle with the sun," Tom replied. "This should do it," he added a few moments later.

Setting the controls, Tom started up to the observation dome. Bud followed. Topside, Tom sighted the sun's altitude, took bearings on the lake, then fed the information into the dynasphere's aiming computer.

Tom's fingers moved back and forth over the electronic console, flicking switches and twirling voltage controls as he connected the dials.

Presently the ship's great crystal sphere glowed bluish red. Tom tuned it to infrared frequency. A vast, curving electrical field began to deflect solar heat rays onto the lake.

"Okay," Tom murmured tensely. "Now break out the electronic binoculars."

Within minutes wisps of vapor could be seen rising form the lake's surface. The boys gazed down in fascination. The wisps became spouting columns of steam, roiling the lake into a seething cauldron. In an hour the valley was almost hidden under the billowing vapor clouds.

...

Finally Tom said, "My father has radioed that I'm needed back in America for the Mars rocket project. But a fresh crew of engineers is on their way here. While the lake bed is being cleaned, they'll lay pipes and dredge irrigation channels so the valley can be turned into farmland without submerging these buildings."

Tom's Spectromarine Selector, by the way, cleaned the buildings.

One last use of the Dynasphere was to rescue Tom. It seems that Tom had been captured and put in an enemy base. In the end, Tom managed to escape and was picked up by Arv who...

"...used the dynasphere's field to spot the base's radar search pulses and also to trap them so that they would get no reflection from us."

I find this fascinating. True, the Dynasphere could do it if it did indeed have the capabilities that Tom claimed it had. What boggles me, however, is the fact that Tom was turning it over to the Government who wanted it solely to retrieve dead satellites from Earth (or Mars) orbit. Surely the Government had an ulterior motive up its sleeve...

How feasible is it to build a Dynasphere? I find the entire concept completely impossible. Here we have a device that can project electromagnetic fields *millions* of miles, and still have enough force to bring a rocket back to Earth all the way from Mars -- and in only 40 days, too! The principles of such a device are mind-boggling. Perhaps, if one knew enough about the true nature of electromagnetic fields, light, and radiation one could hazard to build it, but I have very, very serious doubts -- especially about the absorbing part. I could almost imagine a field that would block out selective rays of radiation -- but absorb? I have my doubts. True, there aren't really any physical laws that prevent this from being done, but how does one do it?

How much impact would a Dynasphere have on civilization? If it were marketed right (and perhaps given a new body job) it could prove enormously useful. Let's look at just a few uses it might have:

Defense: The Dynasphere has enormous defense capabilities. It could be the ultimate weapon -- not only would it incapacitate the enemy, there is also no defense. Imagine this: a whole division of enemy tanks is heading for Alaska. What do we do? Simply turn on our Dynasphere and completely -- and I mean completely -- black out the area. No one in the tanks would be able to see what they were doing. Even if they had LED displays it wouldn't help -- the Dynasphere would completely block out all light! No one would be able to flight. This could also be useful if Earth was ever attacked by a hostile alien power -- we simply turn on our Dynasphere and none of the Martians would be able to see what they were doing. This weapon would be completely devastating -- not even infra-red or ultraviolet light would help, as *every* frequency of light would be completely blocked out.

Stealth: The Dynasphere would be the last word in stealth technology. Simply load one onto whatever you wanted to radar-proof and you've got a complete radar shield. The shape of your plane -- the proximity of your ship to radar -- none of this would matter anymore. In fact, you would only need one of these per squadron; after all, you only need one to completely absorb every radar impulse the enemy could generate.

Invisibility: The Dynasphere could be used on any spacecraft as the ultimate cloaking shield. No camera or instrument could possibly see you, for the simple reason that you would be absorbing every single light ray in your immediate vicinity. As no light was hitting you, you would appear perfectly black -- and thus match the backdrop of space.

Satellite Retrieval: The Dynasphere was designed for this, and it could prove excellent at it. If you send up a satellite and it malfunctions, simply send warm up your Dynasphere and retrieve it -- even if it is in deep space. One wouldn't have to worry about space debris anymore; just send up a Dynasphere to vacuum the heavens. Also, maybe -- just maybe -- this could be used to retrieve asteroids from the asteroid belt, thus giving Earth yet another moon.

Terraforming: The Dynasphere could be used to terraform the Earth in many, many ways. Tom already demonstrated its ability to boil away lakes; I'm sure the same technique could be used to remove swamps as well. However, the Dynasphere could really prove its value on another planet -- say, Mars. One of the first things scientists figure is necessary to terraform Mars is to warm up the planet. With the Dynasphere, this is made a simple task. All you would need is a couple Dynasphere's positioned in deep space relatively close to the sun. Once they are in place, have them adjust their electromagnetic fields to pinpoint solar radiation on Mars -- I'm sure you could heat it up enormously in very little time. Maybe, after the technology is perfected, a single Dynasphere could be put in orbit around Mars and used to keep Martian temperatures at an Earthlike seventy degrees Fahrenheit.



Minor Inventions: There are a number of new inventions in this book, some of which are mentioned only in a minor way. The biggest of these "minor" inventions was Tom Swift's **electrogel**. The electrogel, which Tom invented to plug the underground stream that fed Lake Kali, was an amazing substance that, though liquid, could be solid simply by passing a current of electricity through it. The book gave the following information on this fascinating substance:

..."A valve to plug the inlet."

"A valve?" Bud echoed. "I don't see any hardware in that gunk."

"Not a metal valve. This is a colloidal solution of very fine particles that will set, or coagulate, into a gel."

...This time, the setup on Tom's workbench consisted of a tall glass cylinder with a purple plug inside, about halfway down from the open top. Two insulated wires were connected to the plug through the glass wall of the cylinder.

"Let me guess," Bud said. "This is your valve and it's made out of that purple jelly."

Tom chuckled. "Right. But it's harder than jelly. I've named it 'electrogel.'"

"Okay. How does it work?"

Tom poured some water into the cylinder. It seeped quickly through the purple mass, which appeared to be porous. Tom opened a petcock at the bottom of the cylinder and drained off the water, then said, "Now watch what happens when I send a current through the plug."

He closed a switch and poured some more water into the cylinder. This time, the electrogel had become impervious to the water. Not a drop seeped through!

Bud watched in amazement. "Say, that's quite a trick! What's the secret?"

"The electricity polarizes the colloidal particles in a way that opposes any infiltration of water molecules."

Bud blinked and grinned. "Great! That tells me nothing, but I'll take your word for it."

Tom explained that a huge quantity of the electrogel could be compressed into a small steel tank or cylinder for easy handling and then released underwater at the Lake of Kali inlet.

So, in short, Tom took his electrogel, released it near the inlet of the lake he wanted to plug, let it disperse throughout the liquid, and then turned on a current of electricity. The electricity then caused the colloidal solution to solidify, creating a very effective plug.

How just feasible is electrogel? I don't know. Someone might be able to cook up a batch of chemicals with the needed properties, but I suspect that there is more to this than meets the eye. Besides, what uses could it possibly have? This strikes me as a one-time invention created to solve a one-time problem. I could be wrong, but I honestly do not see any possible uses for an electrogel.

There is one other invention mentioned in this book, and that is Tom Swift's "electronic binoculars". The binoculars were only mentioned in an offhand way, but they were mentioned several times and they got me to wondering. Binoculars, by definition, have nothing to do with electronics. They are mechanical devices, pure and simple, built out of two curved pieces of glass. How in the world could one make a pair of electronic binoculars? There's nothing there to electroize!

Maybe -- just maybe -- they were a modification of Tom Swift's Megascoppe Space Prober. If you'll remember, this device used radio waves to paint a real-time picture of any object anywhere in the universe. Perhaps Tom Swift adapted this invention to serve in the capacity of binoculars, thus giving the power of a telescope to an ordinary pair of binoculars, and maybe the author forgot to mention it.

Maybe.

Update 5/3/2002: A person by the name of Paul sent me this information. It looks like Tom's electrogel was not so far-fetched after all!

I ran across a reference in the July 1992 Scientific American (pg 111) on an article "Fickle Fluids" which describes fluids where the viscosity may be controlled by electric fields. I did a google search on:

electrorheological fluid valve

One of the URLs that turned up was:

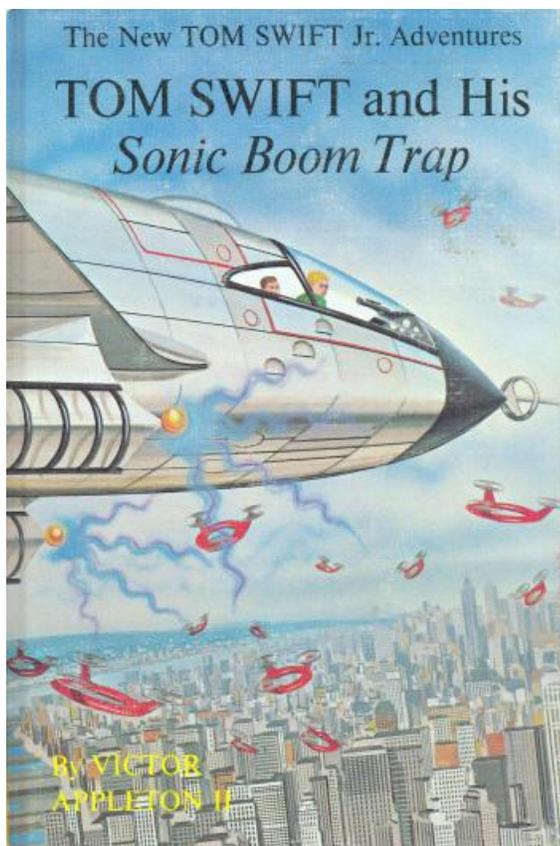
<http://www.mmc.or.jp/no.12/MicroValve.html>

Development of Micro Control Valve Using Functional Fluid

a google search with: electrorheological fluids also turns up a number of interesting URLs.

Very interesting!

#26. Tom Swift and his Sonic Boom Trap (1965)



Summary: A weird blast of sound engulfs an American city. Tom is caught in the panic while visiting there to demonstrate his new sonic boom deadener--the Silentenna--at a Noise Reduction Conference. A top-rank scientist, John Wyvern, who is also attending the conference, mysteriously vanishes the day of the sonic attack.

Attempts on the lives of both Tom and Wyvern's pretty daughter intensify the young inventor's determination to solve the mystery. A clue to John Wyvern's whereabouts takes Tom to the sun-scorched Australian Outback, where he uses his latest invention-- robot bloodhound--to track down the missing scientist, but a deadly bush fire wipes out the trail.

Meanwhile, other cities in the United States have suffered terrifying eruptions of sound. The President receives an unsigned ultimatum, threatening an all-out sonic blitz unless the blackmailer's price of ten million dollars is paid.

Tom's Silentenna offers the only hope of defense--but to perfect it he needs a special liquid-crystal device which only the missing scientist can supply. The young inventor's race against time to thwart the unknown sonic enemy will keep

every reader's pulse pounding with excitement and suspense.

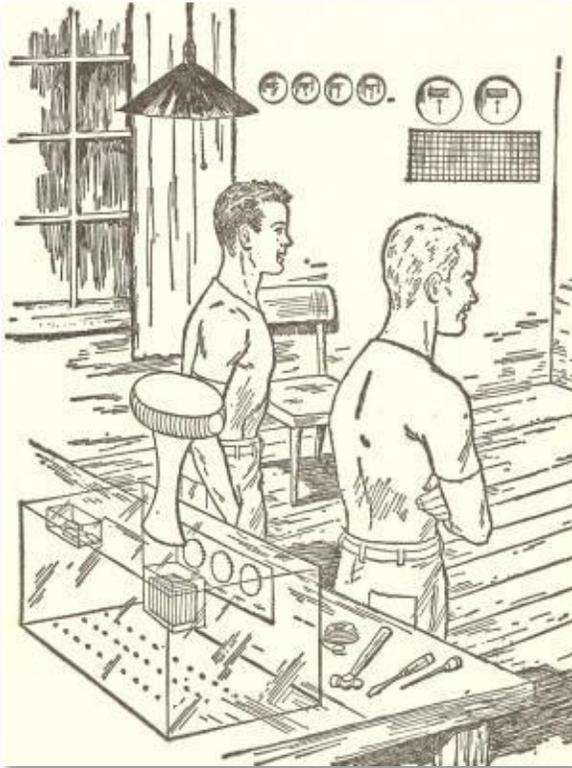
Major Inventions

There are two important inventions in this book: the **Silentenna** and **F.I.D.O.** Since the amazing Silentenna is more important and more incredible, I'll discuss it first.

The *Silentenna* is Tom's attempt to build a machine that can cancel out sound. The idea behind it is simple: the machine detects sounds, analyzes their wave pattern and then beams out a sound wave that is exactly out of phase with the wave it detected. These two waves would cancel themselves out, producing silence.

The reason Tom was developing a *Silentenna* was to solve the sonic boom problem. As is generally known, when a plane exceeds the speed of sound it creates a sonic shockwave that trails behind the plane. This shockwave is very dangerous: not only is it loud and annoying, it also has the ability to shatter windows,

ruin crops, and in general cause widespread damage. This is one of the reasons why supersonic airliners do not sail the skies as futurists once predicted: no one wants an airplane that pulverizes the country it is flying over, so supersonic flight has largely been relegated to oceanic crossings. If someone could develop a way to cancel out or remove the shockwave the last hurdle to supersonic flight would be solved -- and that is exactly what Tom Swift hoped to do.



How does the Silentenna work? Simple sound cancellation: the sound the Silentenna emits is exactly out of phase with the sounds it detects. As Tom Swift put it:

"You see, this transducer on top of the Silentenna emits sounds of equal frequency and volume to any sounds which the device 'hears,'" said Tom. "But the output sound waves are exactly out of phase with the input, so the incoming sounds--in this case, Bud's whistle--are canceled out."

This is a well-established fact; airplanes use this method to reduce engine noise, and I have heard that some construction sites have implemented this sort of system to keep noise down to a manageable level. The problem, however, is that this method can't get the complete silence Tom was able to achieve...

How well did Tom's Silentenna work? Tom built several models of his Silentenna. The first model (Mark I) worked perfectly but only at a short range. In the first chapter there is a beautiful scene when Tom uses the Silentenna to play a joke on Chow. Chow had been annoyed with the robotic dog Tom built; when FIDO got in his way Chow tried to kick it -- but FIDO eluded him and Chow hit the ground, hard. Chow heard Bud laughing in the background and wasn't pleased:

"Oh-oh! Plug your ears!" Bud said. "We're about to get blasted!"

"Quick! Inside!" Tom hissed. "I just had an idea!"

He darted to the center of the room as Bud slammed the door. An usual-looking electronic device was mounted on the workbench. Tom barely had time to flick it on before Chow Winkler came stumping into the laboratory.

"Brand my pothooks, boss!" he stormed. "If that hydrophobiated mechanical polecat don't--"

Suddenly Chow's voice was cut off. His mouth continued moving and his jaws worked vigorously, but not a sound came from his throat!

The cook's eyes widened with panic as he tried again and again to shout at the boys. But the silence in the lab remained unbroken. Chow began to gesture frantically and clutch his neck.

Clicking a knob on the electronic device, Tom said calmly, "What's the matter, Chow? Don't be bashful. If there's something you want to tell us, please say it right out." The young inventor kept a straight face, but his eyes were twinkling.

Tom (who seems to be in a playful mood in this book!) plays the same trick later on a loudmouth know-it-all science-fiction writer who later tours his plant as part of a group of reporters. The problem, however, is that this scene isn't possible: while a Silentenna *can* reduce sound, it can't completely eliminate a series of sounds as complicated as a voice. Sound waves travel at a finite speed, and even at electron speeds it isn't possible to analyze a series of sounds like that quick enough and generate a countersound in time to create complete silence. There's more to it than that; but to sum it all up: it can't be done.



Of course, Tom's goal was not to create a way to silence the loudmouths of the world (although this does seem like a noble goal! Perhaps one of these should be instituted in the halls of Congress and used now and then at appropriate moments.) Tom wanted to cancel out sonic booms: was his invention a success doing that?

Actually, no, it was not. In Chapter II Tom Swift had his Mark II Silentenna installed on a plane (although he designed it for mounting under the wings of the Sky Queen). Tom held a public news conference to watch the testing, and in front of a crowd of reporters and officials Bud flew the plane, broke the sound barrier -- and created a sonic boom. Tom was heartbroken: his device helped muffle the sonic shockwave, but it didn't cancel it out.

Tom was confident, however, that he had the right principle. The Mark II worked a little differently than the Mark I:

"As you know, sound waves are transmitted through air by to-and-fro vibration of the air molecules."

Bud nodded. "That much I savvy."

"Well, my Mark II damps out their vibration by pulsing out a repelling force at the same frequency. IT's as if you were to slow down and stop a playground swing by pushing against it every time it swung toward you."

"Sounds great!" said Bud. "How about that snaky coil of tubing?"

"That's the power tube which generates the pulses," Tom replied. "And those long slots are sample intakes, through which the Silentenna finds out the direction and frequency of the sound waves."

Tom did not give up. Working closely with his Dad, he isolated the problem (a faulty crystal) and produced a new prototype. Instead of retesting its effectiveness in sonic booms, though, he instead used it to battle the sonic invaders...

What about the sonic brainwashers? This is one of the few books in the Tom Swift series that does not pit Tom against Brungarians, Kranjovians or hostile forces from Outer Space. No, this time Tom is pitted against two enemies: one group who wants to blackmail the U.S. Government out of millions of dollars, and another group that is brainwashing brilliant scientists and high government officials. The brainwashing scheme is probably the darkest plot in the Tom Swift series. As the book explained:

Delperta confessed that he and his brother had masterminded a worldwide kidnap ring which specialized in seizing top scientists and government officials. The victims were flown to a small jungle island off the Australian coast and then smuggled into the Territory by his brother. Here they were brainwashed to extract their secrets by techniques which the Delpertas had learned in a totalitarian country. The secrets were sold to foreign powers or unscrupulous industrial firms. Then the victims were returned home with all memory of what had happened blanked out.

"We did them no harm," Delperta defended himself.

"Aside from the mind-warping you inflicted on them!" Tom snapped back in a cold, angry voice.

Tom wasn't kidding. Tom stumbled upon the brainwashers when they kidnapped John Wyvern -- a scientist whose knowledge Tom desperately needed to defeat the blackmailers. Here is what Wyvern was like before the kidnapping:

...One was John Wyvern, a top-rank crystallographer from the Sonicon Research Institute.

"That's exciting work you're doing, John, on obtaining a piezoelectric effect from supersmectic liquid crystals," Mr. Swift said as they shook hands. "I hope we'll hear more about it at these meetings."

"You will, indeed. I'm reading a paper on my latest experiments at the morning session tomorrow." Wyvern hastily introduced...

When Tom finally tracked down Wyvern again he was in sad shape:

As they entered, they saw the sandy-haired scientist lying cringingly on his cot. He was cleanly clothed and shaven, but his eyes were as full of fear as ever. He replied only in low mumbles when Tom and the sergeant tried to talk to him.

Earlier in the book when Tom found him in the Australian outback he was in even worse shape: he couldn't talk, he was completely out of his mind and he acted like an animal. The techniques the sonic brainwashers used were very effective: they had reduced Wyvern to little more than a vegetable. At the end of the book Tom and Bud themselves got a taste of the brainwashing treatment. It was crude but effective: simply blast very loud, raw sound at someone long enough and they will go insane. Would that really work? I don't know, but I sure don't want to find out! I suspect it would...

What about the sonic attackers? Tom faced another enemy besides the sonic brainwashers. Early in the book, Tom flew to Detroit to attend a scientific conference. While he was there the city was hit with a sonic attack:

Suddenly a shrill blast of sound split the air...the noise grew louder and louder until the explosion of sound was almost skull-bursting! Many cars pulled over to the curb...

The blasting sound began to rise and fall crazily in pitch. Pedestrians scurried into buildings and doorways, clutching their ears...

...A faintly audible crash outside drew their attention to the street. Two speeding cars had just sideswiped each other.

Brakes screeched and another crash could be heard as cars began to jam up behind the two vehicles. Horns honked vainly above the din...

The taxi driver turned a frightened face to the boys and yelled, "Don't panic, he says! Whadda we supposed to do? Plug our ears and go nuts?"

Bud grinned wryly. His own face was looking strained. Even with the taxi windows closed, the din was deafening. Both boys' heads were throbbing from the torrent of sound, and the weird undulations in pitch made it even more nerve-racking.

Pedestrians were running for cover in evident terror. A bulging-eyed woman opened her mouth in an unheard scream, then collapsed on the sidewalk. A man helped her to her feet, then into a store.

...news flashes over the radio reported numerous traffic accidents and cases of people who had collapsed during the eruption of sound...

...several suffered brain damage. Two others almost died from shock reaction...

Speculations abounded. Soon San Francisco was hit with a sonic attack, and then Atlanta. The country was thrown into turmoil and fear; what was behind these attacks? Tom soon found out: he was summoned to the Pentagon and found out that:

"An unsigned letter to the President was received in this morning's mail," Frome [Assistant Secretary of Defense] went on. "I'll read you its contents."

He paused to pick up a typewritten paper.

"Sir: You have already seen--in Detroit, San Francisco, and Atlanta--what can happen to a city under sonic attack. Any city, from coast to coast, is just as vulnerable.

"But the three attacks so far have been only a sample--mere fleabites. Under a prolonged, all-out sonic blitz, a city could be reduced to utter chaos, with all traffic and communications disrupted, and thousands dead or hospitalized.

"We have no wish to carry out such an attack. But the choice is yours, Mr. President. You can prevent it by the payment of ten million dollars...

So Tom's mission became clear: could he use his Silentenna to defend against the sonic attack? Tom decided to try; he was his country's only hope. At first Tom pinned his hopes on finding John Wyvern, for Wyvern was the only man who could build the crystals Tom needed for his Silentenna. When Wyvern was at last located and found to be a mental vegetable, though, that hope was dashed to pieces. Tom, for all intents and purposes, had failed!

This is unheard-of in the Tom Swift series: normally Tom would stay up late a few nights, eat some of Chow's sandwiches and (with a few mishaps and after being knocked out a few times) come up with the answer. After 26 volumes, however, Tom's luck had finally run dry: his invention failed and Wyvern -- the world expert that Tom needed -- had been brainwashed into insanity.

Tom was rescued by an inventor as great as he was: namely, his father, Tom Swift Sr. His father had starred in a 40 volume series of his own; throughout his career he had cranked out one marvel after another: electric trains, war tanks, giant magnets, ocean airports, electric rifles, and many more. Some of Tom Sr.'s inventions saved Tom Jr.'s day: his giant magnet, for example, rescued Tom's Jetmarine from the ocean floor. Tom Jr. might have taken the stage, but Tom Sr. had lost none of his brilliance.

As Tom Sr. explained it, the activator was a simple matter:

Mr. Swift reached into the pocket of his tweed jacket. "I think our problem's solved."

The scientist pulled out a small device made of a glistening white material. It was approximately cylindrical with irregular outer walls and wire leads at each end. An intricate lengthwise coil arrangement was connected to the cylinder by a pair of metal collars.

"Made of Durastress, isn't it?" Tom queried. This was a plastic of amazing strength which he had invented to encase the midget atomic power plant in his flying atomicars.

"Yes, and it never came in handier. I discovered how to cast it to a ten-thousandth tolerance with the liquid crystals frozen inside. Using the Durastress completely eliminated any machining or polishing."

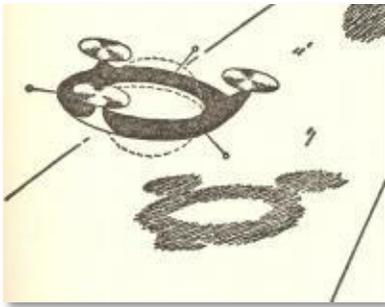
Mr. Swift said he had worked all night before finding a solution. "Varying the potential over the coil changes the size of the crystal, causing it to slide right and left over a central tube--thus varying the frequency."

"Dad, this is terrific! I'll bet it's superior to Wyvern's model!"

"Hank Sterling has a crew turning out a whole batch of these," Mr. Swift added.

Tom was thrilled. He changed his Silentenna to work with the new crystals and then tested them out; they worked perfectly. Armed with the new device, the President turned down the blackmailers. They retaliated by attacking New York City at the height of rush hour traffic. Tom's device saved the day: it reduced the sound to a bearable level, and he traced the sound to its source -- little flying devices he called screaming meemies.

For those who are curious, the New York attack in Chapter 19 is the cover scene for this book. The cover shows the Sky Queen, armed with dual Silentennas, canceling out the sonic blitz. New York is shown in the background with the Hudson River in sight (and could that tall black building be the Empire State Building?) The little red whirllybirds that dot the cover are the screaming meemies -- 14 of them, which is an unfortunate error. As a matter of fact, the enemy only had a handful -- and they were very careful to keep them out of sight. Still, the cover makes for an exciting scene! With a cover and title like that, what Tom Swift fan wouldn't be interested in the book??



What do we know about the screaming meemies? The sound in the blitzes was generated by little devices Bud christened the 'screaming meemies.' The devices were pretty clever: if the sound generators were located in one spot someone might locate them, so they mounted them on little helicopters and flew them all around the city. A moving sound generator is a lot harder to find than one mounted in one place, and before it could be found the attacks were cut short and the devices flown back home.

Tom didn't know about the meemies until after he had silenced the attack on New York. Hank Sterling was the first to spot one:

"We've spotted one of the sound emitters!"

"What's it like?" Tom asked breathlessly.

"Small--about the size of a grapefruit. Three little rotors. It's flying like a copter...I'm going to ram it, skipper!"

...

"Man alive! This thing is really a masterpiece of miniaturization! It even has a small, built-in radar to avoid obstacles."

"It was radio-controlled, eh?" Bud asked.

"Right." Tom traced the guidance and steering systems. "I'll bet this packs enough power to stay airborne for more than a day."

As he probed into the small but tremendously powerful sound generator, Tom's jaw dropped open in a look of utter astonishment.

"What's strong, skipper?" Hank inquired.

"It has a liquid-crystal activator!"

"Like John Wyvern was working on?"

"It could be the same as Wyvern's," Tom said. "They may have forced more data out of him by brainwashing than Delperta let on. Anyhow, this sure explains why they wanted his technical know-how! They needed a flock of these for their flying sound emitters."

If you ask me, the screaming meemies are far more amazing than they let on. An airplane the size of a grapefruit that can stay airborne for a day is a tremendous accomplishment -- it's simply not possible with today's technology. I imagine the Air Force would give a lot to have one of these: not only could they stay airborne but they had radar guidance systems, were remote controlled, and autonomous. And to think they could generate a sound loud enough to destroy a whole city! Clearly, these were some of the most brilliant enemies Tom ever faced. Perhaps such a feat will be visible a few hundred years from now, but not today...

How feasible is it to build a Silentenna? As I said earlier, the Silentenna already exists in many forms; airlines use them to make air travel more comfortable. Sound reduction is a useful technology; I imagine that it is used in all sorts of places. However, what Tom Swift had in mind was not sound reduction but sound elimination -- and that is a whole other field altogether. I am no expert in the field of sound, but I imagine Tom's invention was a little harder to build than he let on. Complete sound cancellation would probably require a radically different technique altogether; I'm not at all sure it's even possible. I also have my doubts as to the usage of a Silentenna to eliminate sonic booms: that sounds so simplistic an answer that I think if it was as simple as that it would already have been done.

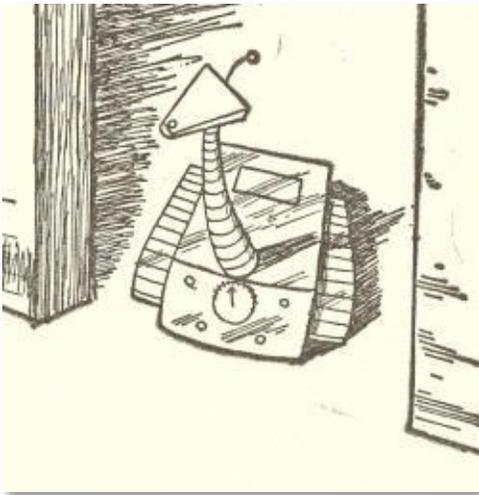
A much more realistic device is the Screaming Suzie in the Rick Brant book *THE WHISPERING BOX MYSTERY*. In that book, a group of criminals had built a device (a 'whispering box') that generated a certain frequency of ultrasonic sounds which knocked people out. The gang at Spindrifft was given the assignment of creating a defense against that sort of weapon, and so they created the Screaming Suzie. Suzie worked along the same principles of the Silentenna: it detected a sound, analyzed it, and generated a countersound that canceled it out. The reason the device was called *Screaming Suzie* was because the cancellation wasn't perfect: while it did render the 'whispering box' harmless, it didn't completely eliminate the sound: it simply decreased it into an earsplitting wail.

How much impact would a Silentenna have on civilization? Quite a lot, I would imagine. The purpose behind the Silentenna was to cancel out sonic booms and give planes a way to travel well in excess of Mach 1 without leaving behind a wake of destruction. If a way to cancel out or eliminate the sonic boom could be found, air travel could change dramatically: today's legion of subsonic planes could give way to supersonic jets capable of going Mach 2 or 3. Long cross-country flights would take only an hour or so;

any point in the country could be brought within a mere hour's journey. The long 13 hour flight from New York to Tokyo (which I have flown many times and let me tell you something: it isn't any fun) could be cut to only a couple hours. Flight would be revolutionized: it could be that, someday, going across town would take *longer* than going across the country. (Isn't that an odd thought?)

Finally, I don't want to leave without saying a few words about **FIDO**! Chow hated this dog with a vengeance; he was always underfoot and giving him trouble. Tom built him as an experiment in thinking processes, and later he became a guard-dog: Tom modified him to protect Wyvern's daughter from the criminals who held her father captive. The dog had yet another usage as well: when Tom needed to track Wyvern in the Australian Outback, he put a modification of his aquatomic tracker equipment onto the dog and used him as a bloodhound to track the missing scientist.

Here's what the book has to say about the electronic mutt:



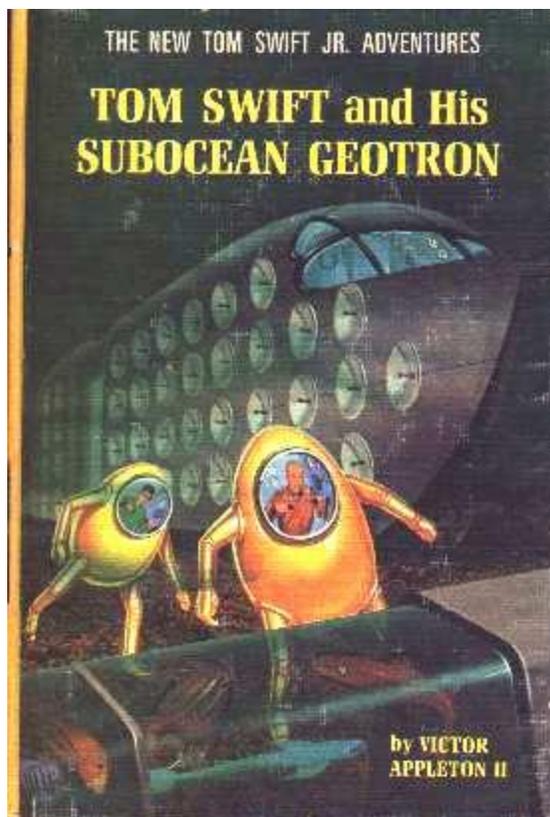
FIDO--named for Feedback Informational Deductive Organism--was a mobile adaptive machine which Tom had built to help shed light on the thinking and learning processes of living beings. It was powered by a thermionic device which converted heat directly into electricity. The automaton moved freely about the lab building, guided by infrared sensors, seeking sunshine and other sources of heat to "feed on."

...The newsmen were intrigued with Fido, especially when they saw how the robot would dart hungrily toward the heat of a lighted match, like a dog responding to a dinner whistle.

Tom explained how Fido had 'learned' the best places in the building to probe for heat energy at different times of day. When his batteries were fully charged, the robot would 'sleep' or 'play' friskily about the corridors, but would start prowling hungrily when its supply of electricity began running low.

Tom doesn't claim to be the inventor of that kind of machine. Gull (filled with love for Tom, I am sure) pointed out that **"Gray Walter's machines in England and 'the Beast' at the John Hopkins Applied Physics Lab are far more advanced and instructive."** Tom, however, simply said that **"...I hope Fido may offer some new angles on memory and learning"** -- and, perhaps, he did.

#27. Tom Swift and his Subocean Geotron (1966)



Summary: Extracted from one of the title pages of the book:

The young scientist-inventor embarks on one of the most challenging missions of his adventure-packed career. The mission: recover a valuable cache left on Earth thousands of years ago by colonists from another planet. Can Tom locate it before his deadly foe the Kranjovians seize the capsule?

Clues to the cache lead him to a location beneath the ocean floor -- near strange Easter Island, with its eerie ruins. Further search is impossible until Tom can invent and build a manned, burrowing mole-mobile--the Geotron.

Tom and his close pal Bud Barclay race against time in an equally challenging project: to build a unique aquarium and stock it with rare species of deep-sea life. If they fail to meet the deadline, a donor's bequest goes to the despotic Kranjovian government.

Their desperate contest with the Kranjovians propels Tom and Bud into a series of hair-raising perils. Tom's weird ordeal as a "bird man" of Rano Kao; the boy's narrow

escape from being buried alive in a cave; their life-or-death undersea duel for the priceless cache -- all go to make up this electrifying, suspense-filled adventure.

Major Inventions

There are two main inventions in this book, and I will deal with them one-at-a-time.

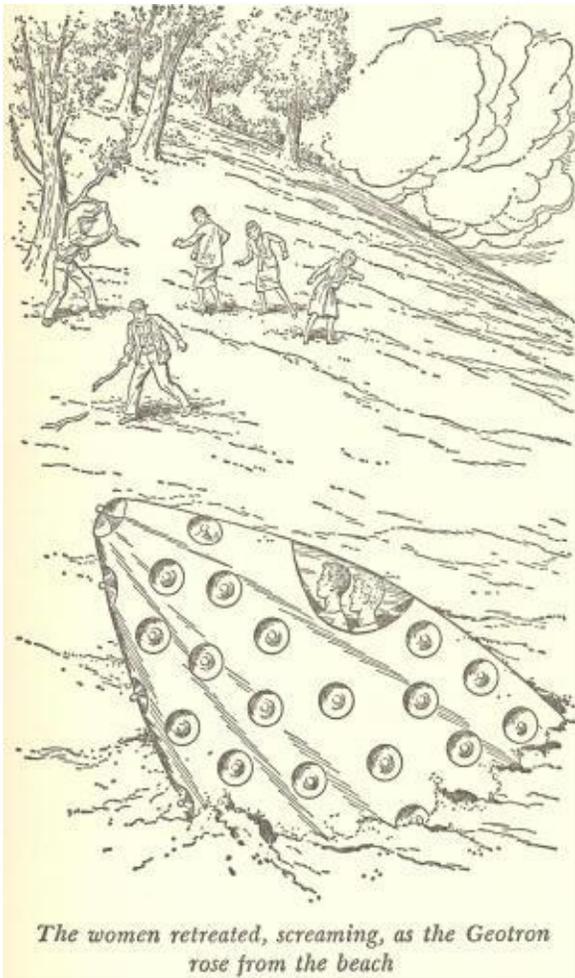
The first -- and most complicated -- invention that is mentioned in this book is the **Subocean Geotron**. The Subocean Geotron (or 'mole mobile', as Bud called it) is a highly unusual vehicle -- unlike everything else on the planet, the Subocean Geotron is at home underground -- or under the ocean floor.

How does the Subocean Geotron work? In one word: repelatrns. If you'll look closely at the picture, you'll see that the Geotron is covered with what looks like satellite dishes. Those are actually repelatrns, and they are there to repel anything that gets in their way.

Say Tom wants to go forward. To do this, all he has to do is gun the repelatrns in the back and step up the power of the side repelatrns so that the dirt is pushed away and the Geotron has a clear path. It should be noted that the Geotron does not make a tunnel; when the Geotron leaves a certain spot, the dirt falls back in place.

According to the book, the biggest problem was finding the power to power the repelatrns. It seems that the repelatrns needed an enormous amount of power, and trying to fit a powerful atomic power plant into the small Geotron was no mean feat.

As for some of the minor details:



The women retreated, screaming, as the Geotron rose from the beach

Tom plunged back to work on his underground burrowing craft. During the days that followed, the wooden mock-up was gradually translated into a full-scale operational model of a tremendously strong, heat-resistant titanium-steel alloy. This was insulated with layers of asbestalon and the amazing plastic, Tomasite, which the young inventor used on both his space and undersea craft.

"We'll need every inch of that insulation if this ever burrows down close to the Earth's mantle," Tom told Bud as they inspected the finished machine. "The temperature increases about one degree Fahrenheit every hundred feet."

"Have you named the job yet?" Bud asked.

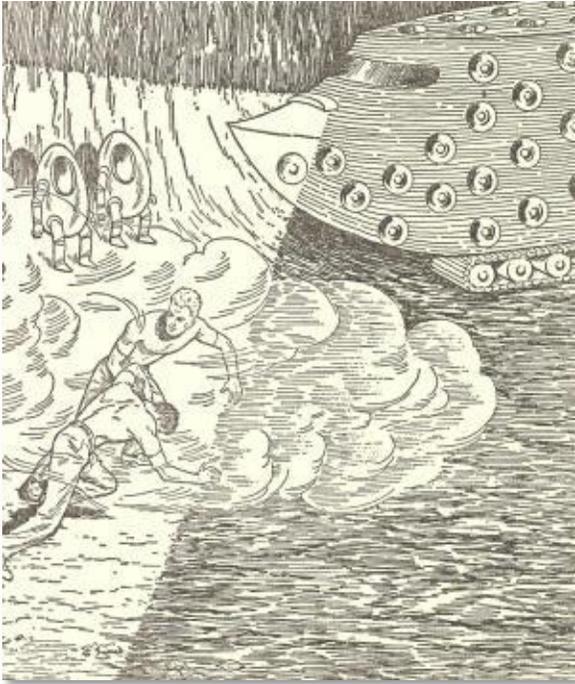
"Yes, I'm calling it a Geotron -- from the Greek word *geo*, meaning 'earth,' as in 'geology.' This model will be named the Mark I."

Bud grinned. "It's still a mole-mobile to me." He noticed a narrow seam around the mid-section of the needle-nosed craft. "What's this for?"

The Geotron actually has two separate cabins, fore and aft, that slide together like sleeves over a short central cylinder," Tom explained. "In case of trouble at either end, the other cabin can rise to the surface alone."

"Like a worm cut in half, eh?"

"Right. There are two power-plant units and two complete sets of controls -- once for each cabin. And you'll notice the tractor treads for ground-crawling are in two sections, also."



What problems did Tom encounter when trying to build the Subocean Geotron? First, as I said before, there was the power problem. How can you get enough power to push aside the rocks under the ocean floor? They are under tremendous pressure, and trying to shove them aside really would take a lot of power. Somehow Tom licked the problem with some type of atomic engine, but the book didn't go into details.

Another problem encountered was gaps. In the book, Tom once "fell up". It seems that he once broke through the wall of a cave, and the pressure inside the cave had forced the Geotron upwards, made it collide with the ceiling, causing much damage. To resolve this, Tom added some kind of limited-range radar that would warn him if he approached any caves or holes in the rocks.

A third problem: the Geotron had the tendency to swerve and roll side-to-side. The cause of the problem wasn't explained, and I suppose that it could have been

anything. Tom fixed the problem by "having the Geotron gyrostabilized", whatever that means.

How feasible is it to build a Subocean Geotron? Once again, the answer to this question hangs on the answer to another question -- how feasible is it to build a repelatron? The Subocean is only another application of the revolutionary repelatron, so, if you can build repelatrons, you can build a Subocean Geotron. On the other hand, if repelatrons are impossible inventions, so is the Subocean Geotron.

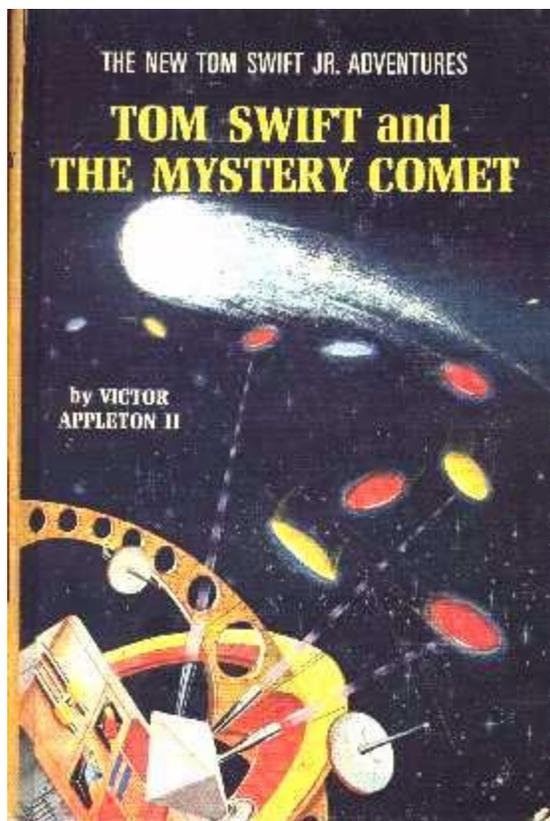
How much impact would a Subocean Geotron have on civilization? What do you think? If someone gave you a Subocean Geotron, what would you do with it? From what I understand, there is really very little demand for a vehicle that can plow through the ground. Mining companies *might* be able to use it to scout out land for new mines, and oil companies also might find some potential uses for it in the field of locating new oil deposits.

The Geotron would completely revolutionize the art of war, though. Imagine what a defense problem it would be if you had to worry about underground invaders! Even if you didn't bother to arm your Geotron it could still prove deadly in its ability to carry things behind enemy lines. Guarding against an incoming Geotron would be impossible, as radio waves cannot see underground objects.

The next invention of Tom's in this book is a type of super-strong glass. No real details were given on it -- in fact, the book doesn't even mention its name. The book does say, however, that the glass can withstand pressure of "fifteen thousand pounds per square inch"; however, it does not say what thickness of glass is required.

There is so little information on the glass that, for now, I'll pass up discussing it. After all, there's very little to discuss.

#28. Tom Swift and the Mystery Comet (1966)



series.

Summary: Extracted from one of the title pages of the book:

Tom Swift Jr. realizes one of his greatest ambitions when the U. S. space agency commissions him to do a comet probe. With his latest invention, the telesampler, Tom hopes to glean unknown scientific facts from the next comet to pass near earth-- and even, perhaps, make a manned landing. But his erstwhile enemies the Brungarians are a threat to the daring research project and U. S. scientific prestige.

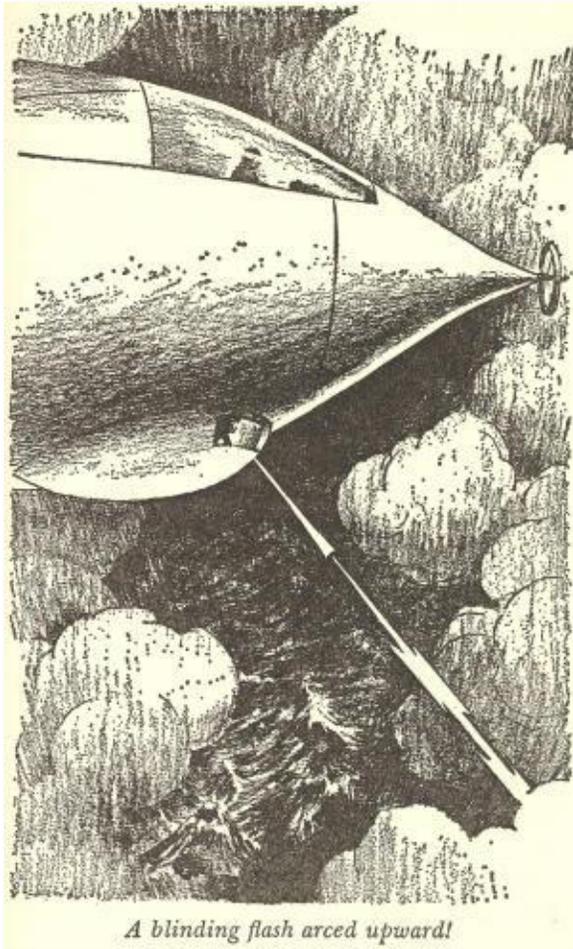
Meanwhile, weird unidentified flying objects blazing across earth's skies are causing the U. S. Department of Defense great concern. When Professor Feng, of the University of Heidelberg, gives Tom a strange clue to the UFO's -- a clue that dates back to the Middle Ages -- the young space scientist is soon caught up in a web of danger and intrigue.

How Tom succeeds in solving the complex riddle of the UFO's -- just in time for a desperate race with a deadly comet as earth's fate hangs in the balance -- makes one of the most tension-packed, thrilling stories in the Tom Swift

Major Inventions

Unlike most of the other books in the series, there aren't any really big inventions in this book. There is one invention, however, and as it is pretty important (to the story, anyway), I'll discuss it here. That invention is the **Telesampler**. (Do you see the diamond thing on the cover of the book? That is the Telesampler.) The Telesampler is actually a small one-way transporter, as it "beams" up small portions of material -- any material -- and ships them back to a container, where they materialize -- but don't reassemble to create the original object.

How does the Telesampler work? In the words of Tom Swift:



stuff come back to you?" Chow asked.

"They're in an ionized state, so the echo -- or reflected beam -- carries them back to the telesampler. And the tubing connected to the antenna dish is a wave guide that carries the particles to the tank--which is the box Bud was scooping the icing from."

How feasible is it to build a Telesampler? The whole thing, I must admit, sounds just fine in theory. In fact, it is the most realistic description of a transporter that I have ever seen in science fiction. However, something about the carry-the-particles-back stage bothers me. Why would the particles be carried back to the telesampler by the reflected beam of light? Can light -- which is merely an electromagnetic wave -- carry objects? I don't think so, but I could be wrong. Are there any scientists out there that could solve this one for me?

Even if it did work, though, I would suspect that it would use *enormous* quantities of electrical power -- effectively making it quite unfeasible.

"...the device operates by an electromagnetic wave action. In principle at least, it can work at ranges of hundreds of thousands of miles."

"Hoppin' horned toads!" the cook blurted. "Then if I cooked up a mess o' frijole beans out in Texas, you could sample 'em right here in Shopton--is that what you're sayin'?"

"I could if I had a clear line of sight and my telesampler generator enough power. This experimental lab setup couldn't do it, of course. Anyhow," Tom added with a chuckle, "I'd rather have you dishing up chuck at Enterprises, pard."

As the boys tackled the appetizing lunch of steak and French fried potatoes, Chow continued to peer at the telesampler. "How does she work, boss?"

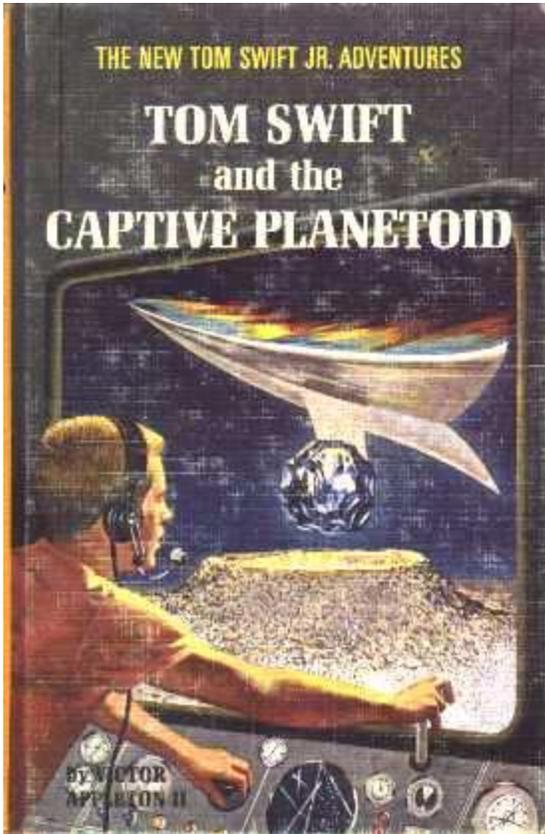
"Well, the antenna pulses out a concentrated beam that knocks particles loose from the surface of the target substance," Tom explained between mouthfuls, "the same way a beam of light makes a photoelectric cell give off electrons."

"How d'ye make them lil bitty party-cules o' the

How much impact would a Telesampler have on civilization? The Telesampler would most likely have very, very few uses outside of geology. NASA, of course, would probably put it to use in the stead of a sample-return space probe. No longer is it necessary to send probes to planets to pick up specimens -- aim your trusty telesampler at the planet of your choice and beam up a few samples! Mining and oil companies might be able to use a modified telesampler to test for underground oil fields and mineral deposits -- no more costly, time-consuming drilling would be necessary. This would also be a great tool for aerial prospecting -- simply put the telesampler on automatic, hook it up to a computer, and let it rip. Then, a few hours later, come back and see what samples you have and where the deposits are.

The use of the Telesampler would be greatly limited because of two important things: it cannot beam objects up from underneath things, and it cannot reassemble them to form the original object. This makes the Telesampler very realistic, but it hardly expands its potential uses...

#29. Tom Swift and the Captive Planetoid (1967)



Summary: Extracted from one of the title pages of the book:

When weird masked raiders attack a United States spaceport, Tom's plans for his latest space exploration project are jeopardized. The project would launch astronauts on a newly sighted planetoid for an epic voyage around the sun. First, Tom must prove that his latest invention, the Duratherm Wing, can bring reentering spacecraft safely down to earth. A fiery mishap on the test flight is only the beginning of Tom's troubles. Fake evidence results in the young scientist-inventor being accused of masterminding the spaceport raid.

In the meantime, another small planet has been mysteriously captured by earth's gravity. On an expedition to the strange planetoid, Tom discovers a fantastic prize. But grim developments follow. The planetoid is sinking into the atmosphere and threatens the continent of North America with the most terrible catastrophe in history! How Tom meets this challenge with high courage and scientific know-how, and how he outwits his insidious enemies, will bring cheers from his worldwide legion of fans.

The Strange Cover

The cover of this book is, at first glance one of the better ones in the series. It depicts Tom Swift working away at a large control board controlling...well, just what he's doing is not apparent, but it looks important and exciting.

After reading the book, however, I realized that the cover made absolutely no sense. There's Tom, inside his Challenger (no, that isn't the laboratory in the Great Salt Lake desert -- see the picture on page 163 and compare), on some lonely asteroid. That purple object has to be Planetoid Pete -- but what is it doing out in space, landing on a planet? Moreover, Pete is 1km wide -- and yet the Duratherm Wing (which, inexplicably, is *above* -- not underneath -- the planetoid) seems to be many times its size. And what are those bright colors coming off the top of the Wing?

It just doesn't make any sense.

Major Inventions

This book (which is considered by many to be the last Tom Swift Jr. book) is one of the most fascinating books in the series. There are a large number of fascinating points brought up in this book, some of which are Tom's latest invention, the colonization of a planetoid, and the impact of a meteor.

The main invention in this book is the **Duratherm Wing**. The Duratherm Wing (which is pictured, albeit strangely, on the cover) is an amazing feat of chemistry that has a wide range of uses. Its main purpose was to aid in bringing rockets back to Earth, but it also has other uses.

Just what is the Duratherm Wing, and how does it work? The book put the answer to this question much better than I could. Here is what they said:

"What kind o' contraption *is* that in there?" Chow asked, peering through the pane intently.

"A reentry device for spacecraft," Tom replied. "It's called a Duratherm Wing, or Durathermor for short. 'Dura' because it's made of my lighter-than-air foam plastic, Durabuoy, and 'therm' because it uses heat from air friction."

"What's it suppose t' do?"

"Get the spacecraft safely down to the ground from orbit. The Durathermor will serve as a heat shield to keep the craft from burning up in the atmosphere, and also enable it to be steered down to a precise landing, like an airplane."

"Can't you do that already?" Chow queried.

"Sure, in my repelatron spaceship. But rockets and space capsules are different. Most of them can only reenter the atmosphere like a bullet and it's not easy to maneuver a bullet."

Tom explained that his Durathermor could be fitted to the nose of shuttle-ferry rockets making repeated trips to and from space stations. Even more important, it could be used to rescue disabled spacecraft, stranded in orbit.

"How in thunder would you do that, boss?"

"Well, a rescue ship would go into orbit beside the disabled craft. Then an astronaut would get out, lug the Durathermor across the void, and attach it to the stranded spaceship."

Chow scratched his double chin. "Be purty big fer one man to handle, wouldn't it?"

Tom chuckled. "The wing wouldn't be opened up yet. The whole apparatus would be neatly stowed in a compact, fairly lightweight package."

He explained that before firing a retro-rocket to plunge the ship into the atmosphere, the astronaut would trigger a tiny cartridge of highly volatile liquid. This liquid would vaporize, causing a fabric sheath to balloon out in the shape of the wing. Then Durabuoy would foam out of a tank and fill the sheath.

"I guess you know how hot a spacecraft gets during reentry," Tom went on.

"Brand my stew kettle, I sure do! The whole ship glows like red-hot stove lid."

"Much hotter, actually. Air friction can shoot the temperature above 20,000 degrees Fahrenheit. But my Duratherm Wing will stay fairly cool."

The secret of the cooling, Tom explained, lay in a myriad of tiny semiconductor heat cells - - somewhat like radio transistors -- embedded in the fabric sheath. These would convey much of the heat into electricity, which would then be stored in batteries for use later in the flight.

Chow went back to his galley and brought a lunch cart, then stayed to watch as the wind tunnel test continued. He saw Tom and Arv turning small control knobs. These caused the nose and wing tips to curl up and down, or the twin tails to curve slightly from side to side.

"How do you make them thingamabobs curl thataway, Tom?" the cooked asked, puzzled.

"Well, the Durabuoy is allowed to absorb just enough heat to become slightly pliable. But the actual bending is done by fine bimetal strips that are woven right into the fabric."

Chow squinted. "What kind o' metal?"

"Bimetal -- actually two separate kinds of metal bonded together. The storage batteries are used to heat them by electrical resistance. One metal expands more from the heat than the other, so the strip curls slightly. It's the same principle that moves the needle of your oven thermometer. And when al the strips curl, they exert enough force to flex the wing surface."

"Wal, fry me fer an oyster! An' that's how you aim to steer an' fly the whole contraption?"

"Right." Tom added that his Durathermor also had a special emergency crash-landing device, which was activated somewhat like the wing.

...

As he pressed a button, the cylindrical package on the Firefly's nose opened. The huge, glistening fabric sheath slowly inflated to its delta-wing shape and the twin tail booms streamed aft.

"Now the Durabuoy foam is gushing into the sheath and hardening," Tom radioed. "As you can see on your monitor screens, the wing encloses and shields the whole forward end of our craft. But during reentry a small portion of the wing will purposely be allowed to burn away, to provide pilot visibility during the landing maneuvers."

In short, then, what does the Duratherm do? The Duratherm Wing, for all practical purposes, turns a multi-stage rocket into an airplane by temporarily giving it wings upon reentry. With these wings, the rocket can to a limited degree maneuver, land, and thus be reused. The Wing's cooling method is especially brilliant: not only can it withstand the tremendous heat of reentry, it can actually harnesses that heat to generate and store electricity for later use.



fall."

"The same blast would eject a fabric sheath with a foreword, slightly whirling motion. Part of the rocket's exhaust would be used to balloon out the sheath. Then plastic foam -- the

The Duratherm Wing has another use, however, as an air bag for airplanes. In the book, "Eldorado Airlines" contracted Tom Swift to install a slightly modified Duratherm Wing on all their aircraft. The Wing proved its usefulness when one of their planes, newly equipped with a Duratherm Wing, crashed in the Rocky Mountains. Normally, of course, such a crash would almost certainly kill all on board. The Duratherm Wing, however, saved the day by cushioning the impact to the point where the plane was saved.

Just how did the Duratherm Wing work as a safety cushion? In Tom's words...

"Exactly how does it work?" one of the board members asked.

Tom explained that for aircraft use, the device would be mounted in a small pod under the nose of the plane. Using the easel chart in the conference room, he sketched out its operation.

"The pilot would trigger the device as soon as he knew that the plane was about to crash," Tom said. "This would fire a breaking rocket to slow the craft's

same lighter-than-air Durabuoy used in my Duratherm Wing -- would gush out and solidify inside the sheath."

Tom illustrated the result on the chart pad -- a huge, mushroom-shaped Durabuoy crash shield foreword of the plane's nose.

"With its lighter-than-air buoyancy, this would act as both a balloon and a parachute and further help to slow the plane's fall," he went on. "At the actual moment of crash, the cellular structure of the foam mushroom would shatter and absorb most of the shock."

Why would Tom want to invent a Duratherm Wing? According to the book, the bulk of Swift Enterprise's cargo ships were the normal, pointy-nose type rockets, just like all the other rockets used in science fiction during the early 1960's (think of Tom Swift's Star Spear, which he built in *Tom Swift and his Rocket Ship*). Back then, the idea of a Space Shuttle hadn't really gotten around yet. Instead, the science fiction books of the time had their characters building what basically amounted to a Space Shuttle minus the wings. Now, landing these bullet-like vehicles was a tremendous task -- and Tom Swift realized this. He wanted to create a way to make his rockets more maneuverable -- and thus dreamed up his Duratherm Wing, which did the job nicely.

One may ask (and rightly so) why his amazing repelatron drive wasn't used. The repelatron, after all, was the last word in maneuverability. Equipped with one of these, a spacecraft could have landed anywhere with pinpoint precision. I did think of a few reasons, though: the drive might have been extremely expensive to manufacture, the drive might have been too large and heavy for ordinary cargo ships, or the drive might have cost too much to use for everyday purposes. Who knows?

How feasible is it to build a Duratherm Wing? It's hard to say. Piezoelectric materials (that is, materials that convert heat into electricity, as was done with the Wing) do exist today, so there's no problem there. The amazing Durabuoy foam, however, is another matter entirely. I won't say it's impossible to build, but I will say that it's an amazing feat that isn't likely to happen anytime soon. I mean, think about it: here you have a super-strong, lightweight material that can resist tremendous heat and, if impacted beyond its limit of strength, will literally fall apart at the molecular level and thus absorb all force of impact. Moreover, it's lighter than air.

That's what bothers me most about this invention: how would you make it lighter than air? To make it lighter than air, you would either need to make it out of very light gases (which wouldn't work), or you would need to make it hollow (and it certainly isn't, not from the description Tom gives), or you would need a really exotic molecular structure. Somehow, though, this is one I can't believe. Maybe something along the lines of a Duratherm Wing can be thought of, but it certainly won't be lighter than air.

How much impact would a Duratherm Wing have on civilization? The Duratherm Wing would probably find a good market in today's world. One-shot rockets, if equipped with a Wing, could possibly with a little re-design work become cheap, multi-shot rockets, thus saving hundreds of millions of dollars.

It's the airline industry, though, that I think would line up in droves for this device. I mean, think about it for a minute. Today, if a plane loses its engines or goes into a nosedive or loses a wing there isn't a chance in the world that the plane will come through intact, and it's almost assured that everyone on the flight will die. Sure, a plane might have a lot of safety features, but if something serious goes wrong during the flight you are in big, big trouble.

A Duratherm Wing, however, could cut down drastically on casualties by drastically softening the impact. No other device currently on the market actually provides protection for an aircraft after something major has gone wrong. This device would actually give passengers a chance if, say, the plane's electrical system died. Hundreds -- perhaps thousands -- of lives could be saved. Air travel would be made much, much safer, all with the installation of a small, simple, easily maintainable device in the nose of the plane.

Another major item in this book was the colonization of planetoid Bartonian. In the previous book (Tom Swift and the Mystery Comet), Tom Swift had an intriguing idea: why not turn a near-Earth asteroid into a spaceship, outfit it with a crew, and take a trip around the sun? In this book, Tom Swift turned this idea into reality with the planetoid Bartonian.

What are some details about the project? First of all, as I said, Tom Swift thought up this idea in the previous book. Nothing was done at that time, however, for various reasons. In the beginning of this book, Tom Swift Sr. tells Tom that he spotted a planetoid (which he named Bartonian after his father, Barton Swift) that might do -- and from there the project is launched.

Tom went about this project in three stages. First, Tom located a suitable near-Earth planetoid. Next, Tom Swift flew to the planetoid with a large crew and plenty of supplies and proceeded to hollow it out with his atomic earth blaster (see Tom Swift and his Atomic Earth Blaster). Finally, Tom unloaded the crew and the supplies, and after outfitting the planetoid, he returned to Earth.

Here's the main passage dealing with the goals for the planetoid project:

"What's this planetoid project you mentioned, sir?" Bud asked the elder scientist.

"Well, as you know," Mr. Swift began, "planetoids are small bodies which revolve about the sun. We often call them asteroids, but that name is misleading because asteroid really means 'little star.' The official name of a planetoid is 'minor planet.' Most of them orbit in a belt between Mars and Jupiter."

"Some of them revolve nearer to the sun than that, don't they?" Bud inquired.

"Yes, indeed, and some have orbits which cause them to pass very close to earth-- occasionally even between the earth and the moon. Unfortunately, astronomers have no organized search program for these close-approach planetoids."

"A dozen or so have been spotted," Tom put in, "but each one was sighted by sheer accident."

"What sort of project do you have in mind, sir?" Bud persisted, turning back to Tom Sr.

The scientist toyed thoughtfully with a pencil. "I suppose the idea has been kicking around in my mind, and Tom's mind too, ever since the phantom satellite first appeared in our sky."

He was referring to the asteroid Nestria, which had been moved into orbit around the earth by unknown space beings. Tom Jr. had led a space expedition there and planted a base.

Mr. Swift went on. "After you two made your recent comet landing, the idea came back to me strongly; namely, that it was high time to begin a real research program into the wider use of planetoids as space bases."

"Wow!" Bud exclaimed excitedly, "That could open a whole new era of space exploration!"

"You bet it could!" Tom plucked a technical aerospace journal off a shelf and handed it to Bud. "Dad wrote an article for this journal, suggesting some of the things that might be done."

Bud located the article and glanced through it hastily. "Jumpin' jets! Do you think you could really capture a planetoid and steer it into earth orbit, the way the space folk did?"

Mr. Swift nodded. "Why not? I'm sure the energy requirements for nudging a close-approach planetoid into earth's gravity field are well within man's present scientific potential. Of course it would take careful planning to insure against any unforeseen catastrophe. Meantime, a planetoid research program might yield all sorts of important results."

"For instance--?" Bud asked.

"Results such as data on the makeup of planetoids, clues to the mystery of how they were formed -- perhaps even clues to the origin of the solar system. And traces might be found of simple life forms, such as spores from elsewhere in space, that would tell a lot to biologists. Also, attempts could be made to extract rocket fuels from the planetoids, like oxygen and hydrogen, as well as the structural materials."

Mr. Swift smiled. "However, the most exciting possibility of all is one that Tom proposed."

"Let's hear it!" Bud said eagerly.

"Tom convert a planetoid into a sort of natural spaceship for an orbital voyage about the sun."

"Dad!" Tom almost leaped from his chair as he sensed what was coming. "You don't mean you're thinking of actually tackling such a project?" "That's just about what I mean." Mr. Swift's expression reflected his son's excitement. "I didn't want to mention it before and arouse your hopes too soon, but I've been corresponding with some of the top government space planners on the subject. They're all for it, and they're willing to underwrite half the cost as soon as we pick out a suitable planetoid for the project."

Tom gave a joyful whoop.

"Wait!" Bud blurted out. "Let me get this straight! You're talking about planting a group of astronauts on one of those tiny hunks of real estate and letting them swing millions and millions of miles away from the earth?"

"That's right," the distinguished scientists replied. "Such an expedition would provide priceless experience in survival techniques for an extraterrestrial colony in deep space--something we may one day have to undertake on a large scale as earth's population increases."

"How long would the astronauts be gone?"

"Two or three years, depending on the orbital period of the planetoid that was chosen."

How was the colony designed? For practical reasons, the colony on Bartonian was placed inside the asteroid in a large natural cavern. Basically, the cavern was partitioned off, floors were put in, an airlock was put at the mouth of the cave, and that was that!

Some details about all of this from the book:

Work was started at once to convert the huge underground chamber into a permanent home for the space voyagers. A bank of Tom's solar-charged batteries was taken below to provide electrical power for lighting and machinery. A prefab air lock was soon rigged at the inner end of the tunnel. Then tanks of compressed air were opened to fill the cavern with a breathable atmosphere.

...

The underground chamber had been converted into comfortable living quarters, with bunks, galley, recreation area, and workshop. Air recycling equipment had been installed and tanks laid out for hydroponic farming. There was even a television screen for viewing programs relayed from the Swift's space outpost.

The first three cargo capsules had been set aside as a special; research laboratories. Among the supplies brought on the second trip was a large telescope and complete equipment for an astronomical observatory. Mr. Swift was much impressed by what he saw.



How feasible is it to colonize a planetoid? The difficulties with colonizing a planetoid are similar to the ones involved with colonizing anything. Where do you get power? How do you get oxygen? Where do you get your food? How do you dispose of wastes? What do you do if something goes wrong? If you can solve these problems and get a colony on, say, the moon, then I think that you can build one inside an asteroid.

I do have some doubts, however, about Tom Swift's method of colonization. If you'll read the above passage carefully, you'll notice that the entire project was undertaken just as if it was a short-duration mission. Oxygen and electrical power, for example, were imported from earth, and no equipment was provided to enable the colony to make its own. While this will work for short missions, it invites disaster in long trips.

For example: what do you do if you have an oxygen leak? Since you can't manufacture your own, you're just out that much oxygen -- and if you lose very much oxygen, you're dead. And what do you do if one of your batteries loses all of its electrical power? Sure, help might be able to come and get you, but if you're millions of miles away from earth it might not make it in time, and where would you be?

Self-sufficiency, then, is the only way to go for long missions like this one, *especially* if there's no one to rescue you. Don't leave home without it.

(Incidentally, aside from funding, self-sufficiency is one of the biggest problems in landing men on Mars. NASA, for both the reasons outlined above and for cost-effectiveness, wants to be able to both refuel and restock its food supplies while on Mars -- and this is proving somewhat difficult.)

Why would anyone ever want to colonize a planetoid? There are many reasons to colonizing a planetoid. First, if for nothing else, I'm sure the mining industry would love to get their hands on a few planetoids -- I hear some of them are extremely rich in minerals. Now, most of the solar system's planetoids are in the asteroid belt. If you wanted to start mining asteroids, obviously you would need a nearby base -- and the most obvious place would be a large, hollowed-out planetoid.

Planetoids would also be a good place to test life-support systems in a near-zero gravity environment. They would also be the place to set up low-gravity factories. In fact, they would really be good for any kind of base, as they're so cheap to deal with. To build a space station requires a tremendous amount of money, time, and other things. There is tremendous complexity involved. Hollowing out a planetoid, however, is a much, much simpler -- and cost effective -- task.

Still, there's another idea behind all of this that Tom Swift just started tapping into: the use of a planetoid as a spaceship (as was done in the Dig Allen book "The Forgotten Star"). Bartonina admittedly had a pre-set course, but what if you were to put an engine on it? You could theoretically build some tremendously roomy spaceships at very practical costs. I mean, which is easier: building a 1km-long spaceship from the ground up, or hollowing out a chunk of rock and putting an engine on one end? If you chose a mineral-rich asteroid, all of the metals (and perhaps fuel) you'd need would be right there -- you'd just have to assemble the ship and be off.

Admittedly it would be more work than that. It would take a good deal of time to both build the colony and get it self-sufficient. The engines, too, would be a fantastic challenge to build. Still, it's a neat idea, and one that I expect will eventually turn into reality.



Another main item in this book is the **Planetoid Petronius**. In the beginning of the book, Tom runs into an astronomer who tells him that a planetoid has strangely veered off its course. Tom, intrigued, decides to investigate the matter by taking a trip to the planetoid to test his newly modified Atomic Earth Blaster. While there, he makes a tremendous discovery: the planetoid has a core of solid sapphire!

Later, Tom finds out that the veering of the 1-km-long Planetoid Pete was no mistake: its orbit had been calculated a group of fanatics who want it to strike the Earth and cause massive devastation. Tom, then, must save his country! How does he do it? Very carefully, it turns out.

Why was the Atomic Earth Blaster modified? For Tom's planetoid project, he needed to find a way to quickly hollow out a large piece of rock. His normal-model Blaster wouldn't work in the absence of gravity, though, so he had to design a new model. Some details on this:

The spaceship was moored again, and Tom's atomic earth blaster was hauled outside to a suitable drilling site. A launching rig was set up and anchored to the rock with explosive bolts. Then the torpedo-shaped blaster was positioned nose down in the rig.

By this time Petronius' brief night had fallen, so Tom called a halt. The astronauts returned to the Challenger to eat and nap. As Chow served a hearty meal, Tom explained the drilling operation.

"You see, with the planetoid's low gravity, the blaster would tend to rebound out of the drill hole instead of grinding up the rock effectively. So I've added the magnetic clamps to hold it tight to the walls of the shaft."

"Then how can the blaster move along and keep drilling?" a crewman asked.

"It operates in pulses," Tom replied. "The current to the electromagnets flows only while grinding is going on. When the ground-up rock is spewed out of the shaft, the current shuts off. The heat reaction drives the blaster forward until it presses against solid rock. Then the pressure switches the magnets on again."

Are you sure you know what you're doing? The author had Tom Swift doing some pretty strange things. Why do I say this? Well, read the following paragraph:

The blaster was bracketed slowly out of the drill shaft. While most of the crewman remained at their posts, Tom took off in the Challenger. He maneuvered the huge ship aloft so as to aim the microwave beam from its telesampler gun down into the drill hole. When the beam was reflected, it would carry back particles of the substance at the base of the shaft."

Did you get that? Tom Swift needed to know what was stopping his earth blaster. Now, I might have taken a geologist's pick and broken off a sample, or I might have taken out a portable telesampler and beamed up a piece. That's not what Tom Swift did, though. He took off in his Challenger, moved the entire spaceship until it was over the hole, and then beamed a piece up. Talk about cracking a peanut with a sledgehammer!

Just how did Tom Swift save the day? While I won't give it all away, I will copy a few portions to give you a rough idea...

Tom swallowed hard, realizing that countless lives might depend on his efforts. "Yes, I still think we can bring the planetoid down to a controlled landing, Dad. But I'm not sure I can give you all the answers right now."

Frowning, the young inventor paces back and forth near the conference table. "It's a cinch we'll need more than one method to do the job," he mused aloud. "The Durathermor technique will just give us a start on the problem."

Mr. Swift looked doubtful. "You certainly won't be able to impart much aerodynamic lift to a mass as big as Petronius."

"Not with the kind of wing I used before," Tom agreed. "But a parasol-mounted delta wing would at least give us *some* control. And a Durathermor drogue chute, combined with braking rockets, could partly slow its fall."

Tom sat down and grabbed a pencil and paper. "Look, Dad! We'd have to time our operations to the precise second, but here's how we might do it. The chute and rockets would slam on the brakes, but only temporarily. Now, if we set up powerful repelatrns, we could spear the planetoid with our repulsion beams--before it could build up velocity again."

"Hey!" Bud exclaimed. "Why not use repelatrns right now and kick Petronius back into a stable orbit?"

Tom shook his head. "Too late for that, I'm afraid, in view of what Dad and Dr. Volenti have told us about the effects of the Van Allen belt."

"How come?"

"Think how many megatons of H-bombs it took to move Petronius in the first place. To get enough effect, we'd have to keep pouring power with our repelatrns for a long period of time."

"So keep pouring!" Bud urged.

"No used. It would be like putting water into a sieve. Petronius was on a three-hour orbit; but the orbital time is shorter now than the planetoid's sinking. Much of the time it's passing through the Van Allen belt. That would drain off its orbital energy as fast as we could feed it in. Right, Dad?"

The ender scientists nodded. "If our calculations are correct, that answer is hopeless."

Bud scratched his head. "Okay, then how about using H -bombs?"

"Too risky at Petronius' present altitude," Mr. Swift replied. "The effects of radioactive fallout would be impossible to predict."

"Back to you then, genius boy," Bud said, turning to Tom. "Tell us the rest of your plan."

"Well, once we braked the planetoid inside the atmosphere, repelatron beams could keep its rate of fall from accelerating too dangerously."

"Even so, there'd still be a terrific seismic shock from its landing," Dr. Volenti warned.

"True," Tom conceded. "But we could do a switch on the Durathermor crash-landing technique. I mean, instead of using a crash shield to protect the falling object, we put a shield on the ground itself."

Volenti and Mr. Swift bent over the table eagerly. "How do you mean, son?"

Tom penciled a quick sketch. "We build up a mountain of Durabuoy foam beforehand at the exact spot of landing. Of course much of the rocky crust of Petronius would burn away

during entry. When the sapphire cure hits, the foam mountain will shatter and melt. The impact energy will be turned into heat and spread out safely over a large area of the desert."

Mr. Swift and Dr. Volenti exclaimed their approval of Tom's plan.

"Son, this gives us a real hope of staving off disaster!"

"I see no reason why the plan won't work." The astronomer chimed in, "providing our calculations are sufficiently precise."

"Does the Defense Department know of the danger yet, Dad?" Tom asked.

"Yes, we notified Washington early today, but we'd better call again and explain your plan."

"How long before Petronius hits?"

"Ten days by our estimate," Mr. Swift replied.

Tom gave a worried whistle. "Then we'd better get cooking fast!"

The young inventor hurried to his laboratory and plunged frantically into work. He decided that four super-powerful repelatron s would be required for the planetoid landing. These and the Durabuoy mountain posed no technical problems. "Hank Sterling and Arv can handle them," Tom decided. He called the two into his laboratory and explained the requirements.

"With round-the-clock shifts, we can have the repelatron s ready in a week or so," Hank promised. "Where's the landing to take place?"

"The Great Salt Lank Desert in Utah."

"After Hank and Arv had left, Tom turned his attention to the Durathermor equipment and electronic gear needed for the planetoid operation. Scarcely pausing to nibble lunch from a tray, he worked on through the day. It was almost midnight when Tom finally left his drawing board and went to bed.

...

Two odd-looking helicopters were skimming back and forth, each squirting out a ribbon of Durabuoy, like toothpaste from a tube. Tom told Chow this was to build up a huge flat-topped mountain of the white plastic foam. The young inventor had used similar craft to lay an aerial road above the Ngombian jungle in Africa, as related in Tom Swift and his Repelatron Skyway.

...

Soon the Challenger was zooming aloft. Tom steered it into orbit alongside the tiny, hurtling planetoid, then landed gently. Two holes were bored through the rocky crust--one at the stern end of Petronius, the other in the side facing away from earth. The Durathermor drums were lowered into the holes and firmly anchored against the sapphire core. Finally a thrust chamber was drilled into the planetoid's nose and filled with rocket fuel.

...and from there, it was smooth sailing. :-)

Finally, before I close, I'd like to point out that Tom Swift had some incredible tools to play around with. What do I mean? Well, take this one, for example:

The tunnel, ten feet in diameter, had been specially designed by Tom to test the lift and drag characteristics of his Duratherm Wing in mid-atmosphere at speeds up to Mach 10. To create the airflow, pressure was built up at one end of the tunnel by multistage compressors and reduced at the other end by a vacuum pump.

Did you get that? Tom Swift had a wind tunnel that could get wind going up to Mach 10. Does such an invention currently exist? Is there any wind tunnel in the world that can generate wind speeds of even Mach 1? I'm none too sure.

Tom Swift had another fascinating tool: a primitive Tokamak (that is, a fusion power plant). Sure, it isn't called that, but it's basically the same thing: it creates plasma and stores it in a magnetic "bottle" created by superconducting coils. If Tom had but been able to heat the plasma hot enough, he might have been able to create the first fusion reactor in science fiction. :-)

"With this MHD accelerator, I hope -- MHD for magnetohydrodynamic." Tom walked over to a row of apparatus. "This generates a flow of hot plasma -- like the plasma we encounter on reentry. At least it's as close to the real thing as we can simulate here in the lab."

"Okay, I'm listening," Bud said with a grin. "Clue me in on how it works."

"Well, air is pumped through this arc heater, where it heats up almost to plasma temperature. Then it goes through this chamber, where it's 'seeded' with particles of cesium."

"Great. What does that mean?"

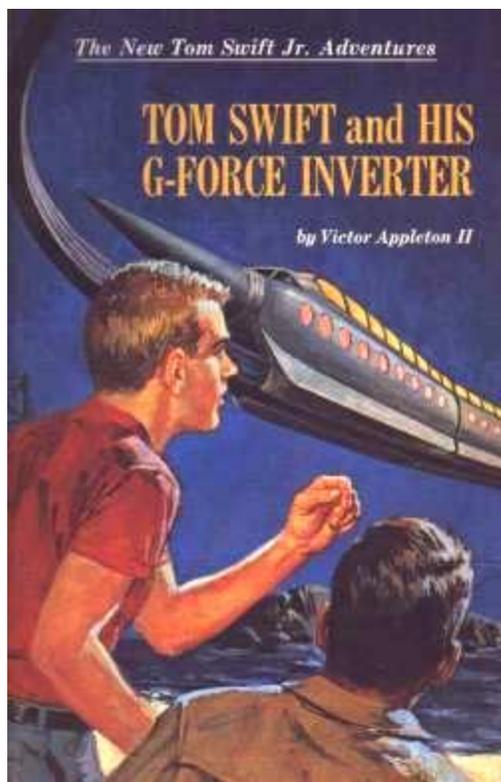
"The cesium ionizes quickly and changes into a true plasma, by having electrons jarred loose from its atoms. And this, in turn, helps to ionize the air and turn *it* into plasma as it flows through the MHD accelerator." Tom pointed to a tubular chamber made of the same

tremendously strong glass used in his deep-sea aquarium. It was would with Dewar-jacketed coils and enclosed in a C-magnet.

"What happens there?" Bud asked.

"Those coils are superconducting, and so are the C-magnet's coils. One pumps energy into the seeded hot air to change it into plasma. The other sets up a containment field to confine the plasma. The plasma jets into this exhaust stack."

#30. Tom Swift and His G-Force Inverter (1968)



Summary: Extracted from one of the title pages of the book:

"Moon Serpents!" Astronaut Bud Barclay gasps into the microphone of his space suit. Tom Swift Jr.'s investigation of the phenomenon reveals that the giant, writhing reptilian forms are caused by gas vapors. When Tom captures a sample of the gas in a metal flask for analysis, he shoots up from the moon's surface into space! Through quick thinking the young scientist-inventor rescues himself and realizes that he has discovered a new powerful energy, which he calls Serptilium.

At this time, a large railroad network is in the market for an advance method of rail travel. A contract will go either to Swift Enterprises or to a rival firm, Cosmoprises -- whichever designs the best super-speed train.

How Tom, using Serptilium, develops his invention and defeats Cosmoprises' evil attempts to win the prized contract makes exciting reading for all Tom Swift Jr. fans.

Major Inventions

The only major invention in this book is the **G-Force Inverter**. Tom built the Inverter to harness a very strange gas called Serptilium that he found on the moon. The G-Force Inverter is the engine of a super-fast train (called the Monoswift) that Tom built for a railroad company. Using his g-force inverter the Monoswift can be propelled to speeds over 300mph.

How the G-Force Inverter works: In the words of Tom Swift:

Tom explained that he had constructed a double-walled, peripheral chamber around the one containing Serptilium. He had found that by sending a flow of Cryotol [a catalyst that his Father had invented; it liquefies gases at higher temperatures than normal] through the outer chamber, a propulsive force was produced.

The propulsive force, of course, drives the Monoswift forward on the rail. And as for the rail...

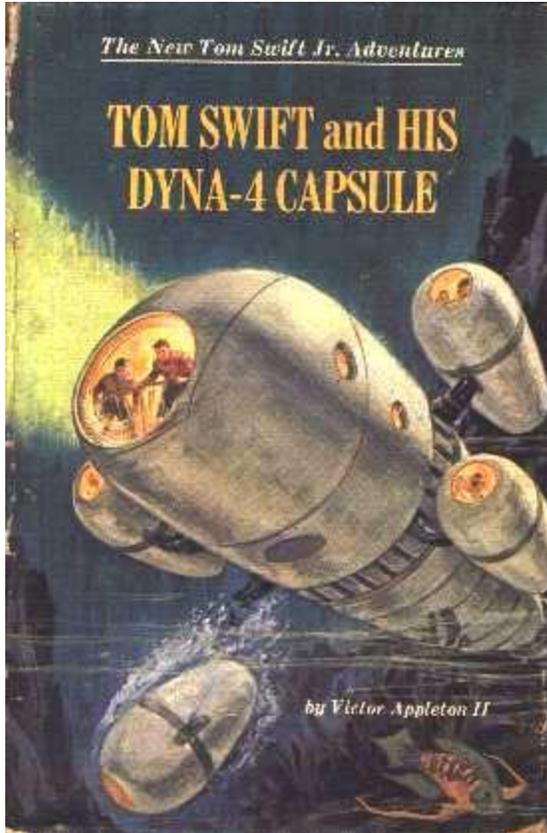
"Instead of a solid rail, I plan on using a special, hollow cable which we'll fill with Serptilium. Then we'll encase the cable in a heating element to vary the temperature of the gas and thus control the amount of minus-G force produced. It will literally float above the ground."

How feasible is it to build a G-force Inverter? A G-Force inverter completely requires an anti-gravity gas. Thus, until an anti-gravity gas is invented, the G-Inverter cannot be built.

How much impact would a G-Force Inverter have on civilization? The G-Force Inverter would have a huge impact on society, mainly as a nearly unlimited source of energy. Serptilium, too, would be used in all kinds of projects -- an anti-gravity gas could be *very* useful. The true usefulness of the G-Force inverter, though, hangs on two very important questions: how much does it cost to run, and how can it be used? If Serptilium is a true anti-gravity gas there would be hundreds of uses for it. Planes could use it to lighten -- or eliminate -- their weight. Rockets could use it instead of costly rocket engines. Gravity-defying buildings could be designed. Bridges could be made stronger, lighter, and cheaper. The propulsion side of Serptilium is also interesting.

Serptilium could also serve as a safety device. A few cans of it, for example, would forever eliminate the possibility of a plane crash due to engine failure. (Wouldn't it be a sight to see a plane stranded at 30,000 feet?) Boats could use it to keep from sinking -- if there's ever any danger, just flip a switch and up she goes. Serptilium might also be able to turn into a rather interesting parachute or life preserver, but that just might be getting a bit far-fetched.

#31. Tom Swift and his Dyna-4 Capsule (1969)



Summary: Extracted from one of the title pages of the book:

What are the green glowing bubble creatures that the young scientist-inventor encounters in the depths of the Pacific Ocean? How do they rescue Tom and his pal Bud Barclay from an attack by the fish men?

Tom's electrifying adventures begin deep in the Mariana Trench where he has based his newest invention, the Dyna-4 Capsule, in a hunt for rare metals. A super submarine, the craft has been especially designed for deep-sea research and exploration.

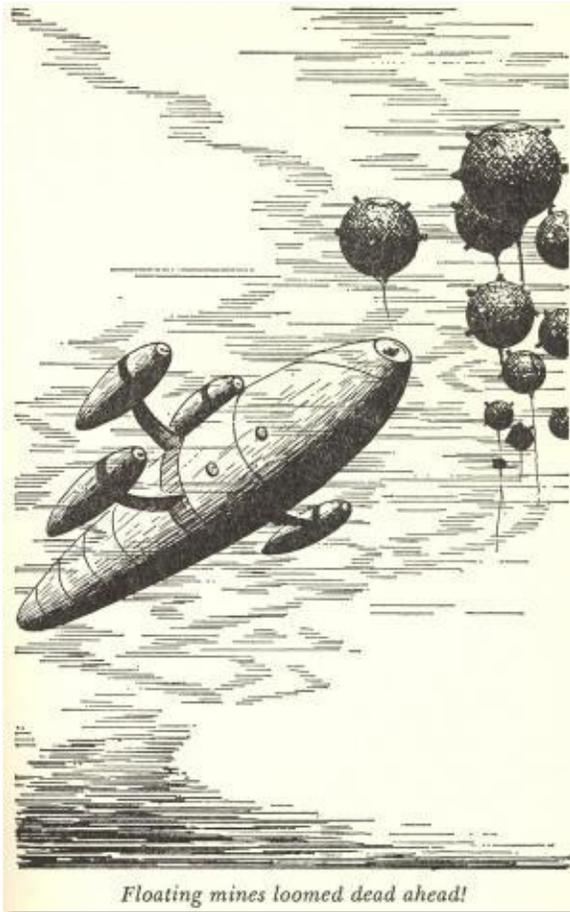
On orders from Washington, Tom takes time out from his own project to recover a stolen vial containing a highly destructive explosive. The top-secret mission turns into a danger-filled whale chase in the Dyna-4 and leads to a showdown with Tom's ruthless foes.

Major Inventions

The main invention in this book is the **Dyna-4 Capsule**. The Dyna-4 Capsule (christened by Bud as "the Egg") is the Flying Lab of the ocean. According to the book, the Dyna-4 is: "an underwater super laboratory, especially designed for investigation in deep-sea environments. It consisted of a central control-and-power unit with four laboratories attached to it. Each was equipped for work in a different branch of science -- biology, geology, chemistry, and metallurgy."

Where did the name come from? Well:

"We got the name *Dyna* from the Greek word *dynamis*, which means power," Tom explained.



The structure of the vehicle is described as follows:

"The Dyna-4's central body was constructed of Tomasite in movable, overlapping segments for compactness, but it could be expanded into a long cigar-shaped vehicle for maneuverability in narrow places. The four labs, also cigar-shaped, would fit snugly against the central body when the struts were retracted. Fully equipped with its own pilot-control unit, each capsule was self-operating and could be detached for individual research projects. Passageways in the struts provided easy access to and from the main capsule and smaller labs.

One interesting fact about the Dyna-4 is that Tom used the Flying Lab to move the enormous Dyna-4 to off the coast of Japan. This is very interesting, as it really shows the true immensity and strength of the Flying Lab.

The 4 side labs, by the way, are held onto the main unit by electromagnets.

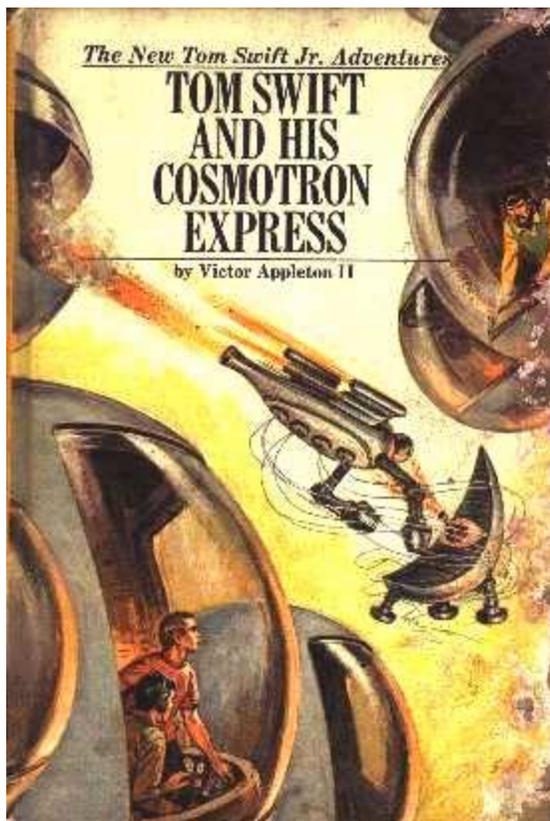
How feasible is it to build a Dyna-4 Capsule? Well, that depends. Vehicles that are equipped with all the

instruments and size of the Dyna-4 have been built. However, their use is restricted to the shallows of the ocean floor -- if they ever tried to descend to the bottom of the Marina Trench they would be completely squashed. The reason for this is because it takes an extraordinary alloy to withstand the enormous pressure that an ocean provides at such a depth. To build even a small, basic submarine that can negotiate the most extreme ocean depths requires some extremely thick coatings of the strongest materials known to man.

To build a vehicle in the style and size of the Dyna-4 you need to find a way to truly conquer the enormous weight of an ocean. Metals -- perhaps plastics -- of amazing durability and strength are required. Until such metals are devised, the Dyna-4 will remain a dream.

How much impact would a Dyna-4 Capsule have on civilization? The Dyna-4 would be extremely useful in undersea exploration and settlement. If you ever needed to explore the extreme depths of the ocean the Dyna-4 would definitely be your choice as not only is it large and maneuverable, it is also completely equipped with whatever equipment you would want to provide.

#32. Tom Swift and his Cosmotron Express (1970)



Summary: Extracted from one of the title pages of the book:

In the biggest, fastest spaceship ever designed by Swift Enterprises, Tom Jr. plans to make a grand tour of the planets in the solar system. But a group of criminal scientist's bent on conquering the universe is out to steal Tom's magnificent *Cosmotron Express* and destroy the young scientist and Swift Enterprises.

Determined to foil the fiendish plot, Tom and his pal Bud Barclay locate the enemy's fortress laboratory but are captured. The boys make a daring escape, only to be faced with an even more grim challenge in their next encounter with the enemy. Pursued on their phenomenal interplanetary journey, they become the targets of VIPER's frightening weapon, the enormous Orb. How Tom, using his revolutionary device the Spider Crab, thwarts the feared, vicious leader of VIPER and his evil followers climaxes this gripping story of scientific combat.

Major Inventions

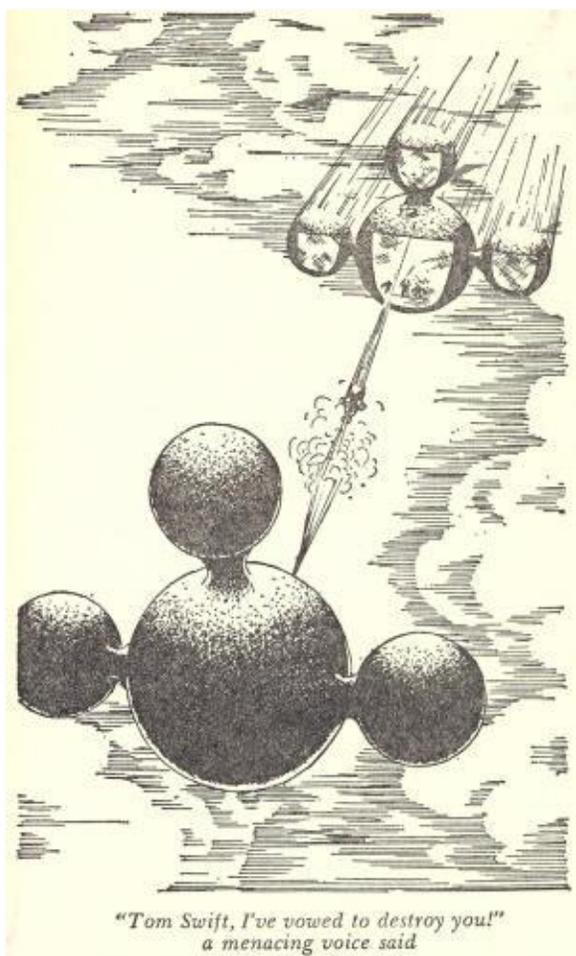
The main invention in this book is, of course, the **Cosmotron Express**. The Cosmotron Express is the largest and fastest ship that Tom Swift ever designed.

How fast is the Cosmotron Express? Well, according to Tom...

"...the moon trip will take only three hours, and the whole grand tour of the planets shouldn't take more than two and a half to three days..."

How can it do this? Tom explains:

"We just don't blast up to a top speed like a rocket and then coast. Our repelatron drive accelerates the ship all the time, so our speed keeps going up. And even though we can accelerate at many times the earth's gravity pull, we don't feel it. Even the solar system looks small when you can do that!"



What is the floor plan of the ship? From what I could gather, the ship is made up of four modules -- a large one in the middle, one on each side, and one on the top. The large module in the middle is the Central Control module. The others are Lab, Hangar and Storage modules. Each module, like the capsules on the *Dyna-4 Capsule*, are complete ships in themselves, completely detachable, and attached to the main module by passageways.

Tom saw to it that the *Express* was well shielded from deadly cosmic rays. Not only does the *Express* have a duel-shell system (an inner shell and an outer shell), but Tom also built the ship from Atomeron (the metal that Tom calls the 'toughest alloy in the world') and coated it with Inertite (which completely blocks 'the strongest atomic rays'). For more information on Atomeron and Inertite, see *Tom Swift and his Ultrasonic Cycloplane* and *Tom Swift in the Caves of Nuclear Fire*.

All of the modules, by the way, are coated with Non-Contam. Its purpose is to prevent the *Express* from "contaminating the atmosphere or surface of any of the planets by rendering our exhaust fumes harmless".

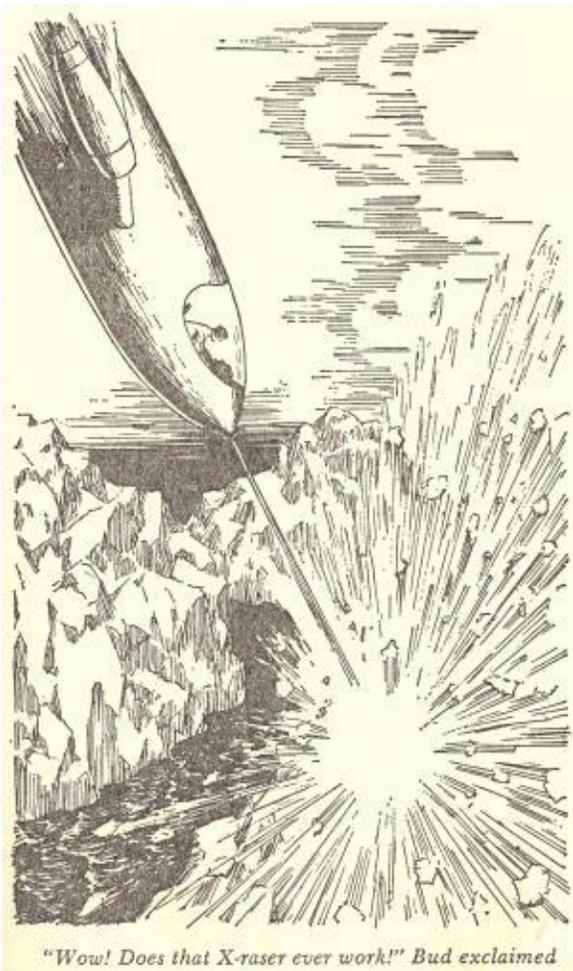
How the Cosmotron Express works: The *Cosmotron Express* uses huge, powerful repelatrons (which will be discussed as soon as I write up a commentary on *Tom Swift and his Deep-Sea Hydrodome*) to move about the solar system. These repelatrons are powered by two systems: a Super-Converter that converts solar energy to electricity, and a Superatomic Cell. The only information that I could find on the Superatomic Cell is contained in these three words from Bud: "Atomic power plus". Assumedly, then, it works on a more powerful type of atomic power -- fusion, perhaps, or something along those lines.

According to Tom, the main drive here is the Super-Converter. The Atomic Cell is used only in the outer reaches of the solar system where the *Express* can't get enough solar energy to run.

How feasible is it to build a Cosmotron Express? Well, until the repelatron, Inertite, and Atomeron are developed one can hardly build the ship the way Tom built it. However, that doesn't mean that it's impossible to build a spacecraft that can really scoot around the solar system with ease. I firmly believe that it can be done, but there is one big problem standing in the way: thrust.

To move about the solar system requires enormous amounts of thrust. Please realize that enormous amounts of electricity are of no use to anyone. A rocket ship depends completely on the principle of "for every action there is an equal and opposite reaction". Electricity, as powerful as it is, cannot produce a reaction and thus cannot propel a ship through space. Nuclear power, solar power, coal power -- it really makes no difference what you use, as all of them produce electricity, not thrust. Until you can find a way to translate pure electricity into thrust you are going to be unable to build any kind of truly space-faring vehicle.

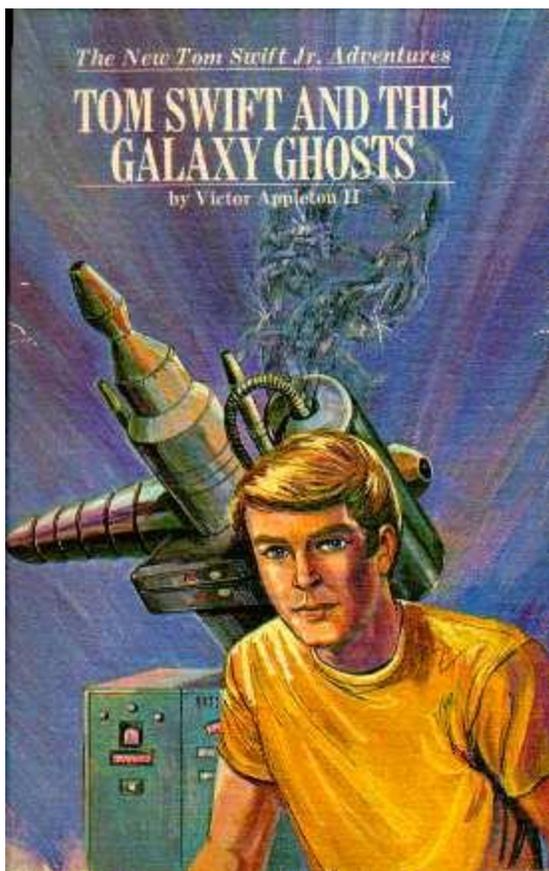
That, really, is the genius behind the repelatron. Tom Swift managed to convert electricity -- in this case, either solar energy or nuclear energy -- directly into a force that can be used to move objects. Until we can learn to do the same, space travel is likely to remain an expensive and slow enterprise.



How much impact would a Cosmotron Express have on civilization? Do I even need to answer this one? The *Cosmotron Express* would undoubtedly have an enormous impact on the exploration of space. One would no longer have to worry about long and tedious trips across the galaxy as one could simply hop in and arrive at his destination in a matter of days. "Space Cities" and "Space Arks" would not be needed when one has a nearly infinite amount of thrust at his back. The colonization of Mars and the outer planets would be expedited tremendously, as the *Express* -- unlike the *Enterprise* in *Star Trek* -- could actually land on the planet and thus deliver cargo firsthand. One could take trips from here to Pluto without a moment's thought about all the expensive fuel one was using -- after all, who worries about the consumption of sunlight?

Minor Inventions: The **X-Raser** (a laser used for specimen retrieval; it's somewhat similar to the Telesampler) and the **Atomic Crab** (a machine that can retrieve astronauts that have floated away).

#33. Tom Swift and the Galaxy Ghosts (1971)



Summary: Extracted from one of the title pages of the book:

With his latest invention, the "Transmittaton," Tom Swift Jr. solves two baffling scientific mysteries. This ingenious device can atomize objects, send them great distances, and reassemble the atoms. What happens when Tom uses the Transmittaton to prevent a catastrophic invasion of Earth by ghosts from another galaxy is only the beginning of a series of spine tingling adventures for the young inventor.

At the same time, Tom and his father are asked to take on an important mission. They are to locate a prehistoric giant mammal believed to be entombed in solid ice in the Andes Mountains and transport it to the United States. Despite attempts by the Swifts' crafty, vicious enemies to sabotage the project, father and son accomplish their dangerous mission with the aid of Toms Transmittaton.

Unexpected thrills and high-voltage suspense fill every page of this gripping story.

(The description was e-mailed to me by Larry Scheflin, and the picture was scanned and e-mailed to me by Glen Rovinelli. Thanks a lot!)

Major Inventions

The main invention in this book is the **Transmittaton**. According to Tom, the Transmittaton basically a glorified, deluxe Telesampler (invented in Tom Swift and the Mystery Comet).

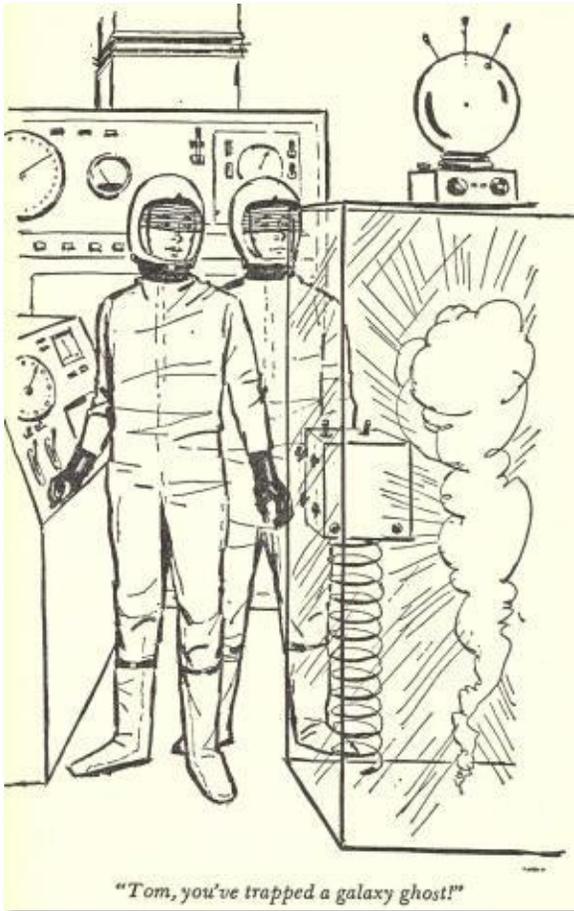
How does the Transmittaton work? Well, from what I could understand, the Transmittaton works somewhat like the Telesampler. The Telesampler, in Tom's words, works by:

"Well, the antenna pulses out a concentrated beam that knocks particles loose from the surface of the target substance," Tom explained between mouthfuls, "the same way a beam of light makes a photoelectric cell give off electrons."

"How d'ye make them lil bitty party-cules o' the stuff come back to you?" Chow asked.

"They're in an ionized state, so the echo -- or reflected beam -- carries them back to the telesampler. And the tubing connected to the antenna dish is a wave guide that carries the particles to the tank--which is the box Bud was scooping the icing from."

However, the Transmittaton has a few features that the Telesampler lacks. For one, the Transmittaton does not need a line-of-sight fix on either the object that is being captured or the receiving tank. The Transmittaton also seems to have a few receiving difficulties -- Tom had to add a few pieces of equipment to keep the Transmittaton from creating hundreds of the objects he was beaming.



How feasible would it be to build a Transmittaton?

It would be very, very difficult, if I understand it right. How can it possibly ionize all of the atoms of something the size of a woolly mammoth, beam them halfway around the globe, and then reconstruct it perfectly? There are untold trillions and quadrillions of atoms in something that large -- how could they be accurately be transmuted without completely destroying the object?

And how can it capture objects beyond or away from the line of sight? Wouldn't aim be very, very important with this invention? How could you possibly transmit objects to the opposite side of the globe?

Any ideas?

How much impact would a Transmittaton have on civilization?

The impact a Transmittaton would have depends on two things -- how expensive it is to run, and whether or not it can transmit live creatures without killing them. If the Transmittaton is relatively inexpensive and can handle people we just might see a revolution in transport. Wouldn't it be nice if you didn't have to spend six hours on a plane and three hours in

Pittsburgh just to get home from a business meeting? Oversea flights would be revolutionized -- no one would ever spend 30 hours on a plane trying to get from Little Falls, Minnesota to Shanghai, China again.

The Transmittaton's impact in space flight would be very minimal, mainly because you have to have a receiving tank at the other end. After all, why beam a hundred million-dollar probe to Titan just to have it

shoot on by because there was no tank waiting to receive it? If you did, somehow, manage to construct a receiving tank on the other end, space travel to that location would be enormously simplified. No rockets of any kind would be needed -- simply step on the platform, press a button, and you're there.

Cargo shipments might find benefits, but, as I said before, it depends on how much a Transmittaton would cost. Cargo always finds the cheapest solution, so it's highly unlikely that cargo would suddenly start being beamed all over the world.

It's important to remember, though, that the Transmittaton is NOT a Transporter. In Star Trek, the Transporter can materialize objects without there being a receiving tank on the other end, leaving open all sorts of interesting possibilities in both peace and war. The Transmittaton needs that receiving tank, so a world that had it would not be in danger of atom bombs suddenly materializing over their cities. They might have to watch out for spies, though, as a receiving tank in the heart of Washington could do a lot of damage...

How I happened to read this book and why I think something should be done about it

One day as I was at the library it struck me that, somewhere in the land, there should be a copy of *Tom Swift and the Galaxy Ghosts* in the hands of a library. If this was the case, then it should be possible for me to special order it from the library. This I did, and I found out that the Texas A&M University Library had a copy of this book, which they loaned to my local library, who then loaned it to me.

The book that I got had, unfortunately, been re-bound in an unattractive (but very sturdy) blue hardcover binding. All the pages were intact and in perfect condition. The only flaw that I could see was an ink stamp on the side of the pages that read "TEXAS A&M UNIVERSITY LIBRARY". Other than that, there was absolutely nothing out of the ordinary about the book. Except, that is, for the story inside it.

I had been forewarned that the story was badly written, and it was. It was terribly written. Obviously, the person who wrote this book was not a Tom Swift Jr. fan. All sorts of errors were found throughout the book -- such as the "refilling of the Cosmotron Express' fuel tanks" just to name one (for those of you who haven't read book #32, the Cosmotron Express works by solar energy and atomics -- it has no fuel tanks).

But, boners aside, the book was still bad. No emphasis to speak of was put into the science of the inventions, or on the problems Tom had trying to work out his inventions, or on pulling jokes on Chow, or on the trouble Tom invariably gets into when he tests the inventions. Tom didn't work late at night in his laboratory trying to get his Transmittaton to work. Nope. Instead, Tom was far off into the Andes or somewhere else chasing after Brungarians spies while his father or some other unknown scientist worked out the bugs of his invention. This unique behavior on Tom's part is *entirely* out of character -- nowhere, *nowhere*, in all of the other 32 books did anything like that occur. In other books, if the invention itself wasn't already around when the book started (as in book #1) Tom always insisted on working on it himself and spent many long, hard hours at the laboratory doing so. This book reminded me of the new Hardy

Boy books that you can still buy on the shelves today -- it's all glitter, but the glitter is only electroplated -- there is no gold to be found. Tom, in this book, had utterly lost all of his character.

The cover of this book, I think, emphasizes this point. Now, I'll admit that most of the covers of Tom Swift books do not completely agree with the story inside them. This cover, however, is so bad that I think that it deserves special attention. First of all, there is the little fact that the Transmittaton doesn't even faintly resemble the device pictured on the cover. Secondly, there is the little fact that the scene on the cover never happened in the book -- if it had, the radiation from the Galaxy Ghost (which is that little wispy creature supposedly being emitted from the Transmittaton) would have instantly killed Tom.

Beyond the scientific flaws with the cover, however, there is the radical change in Tom. I recently received a letter that expresses the radical change in Tom very well, and since he has agreed to let me post it, here it is:

Dear Jonathan,

This morning was the first time I have ever seen the cover of the Galaxy Ghosts. I was sickened to the point of nausea, for several reasons:

1. "Tom" is just standing there. There is no display of excitement or conflict at all.
2. "Tom" has a full head of "1970's hip" hair (including sideburns) instead of his standard crew cut. Has he been recruited by the Communists?
3. "Tom" appears to be wearing makeup, eyeshadow, or both. He does not look like your typical scrappy inventor, to put it nicely. In fact, he looks like a rich kid spoiled by the commercial success of his inventions, and perhaps he has been spending too much money on clothes. What happened to his striped T-shirt?

After reading the synopsis of the book, maybe this is a fitting cover, after all.

David Smith

But even when you only have the bare plot itself left and ignore everything else, the book is still disappointing. No contact was ever made with the Swift's space friends, and Tom's entire canon of wonderful inventions is left to waste. Take, for example, the time [in book #33] when he was driving along in a car and was almost bullied off of a cliff. What was Tom, the inventor of the Triphibian Atomicar, doing riding a normal automobile? Or take the time [in book #33] when the frozen mastodon was lying on the bottom of the sea. Why in the world did Tom go after it in the Jetmarine, which is the most primitive of all of Tom's undersea craft? Why not use the Dyna-4 Capsule or the Diving Seacopter? Both of those inventions are far more suited to exploring the depths than the Jetmarine ever was. And why did...well, you get the point.

This book could have finally solved the many unanswered questions that kept popping up in the books and been a showcase of all of Tom Swift Sr.'s and Tom Swift Jr.'s inventions as well. The author could have used his skill to show just how earth shattering some of those inventions really were. Wouldn't it have been neat to have a scene where the space friends finally came to earth, or a scene in an America that had put Tom Sr.'s and Tom Jr.'s inventions to use? Surely the author could have spared a chapter or two and described how Tom's inventions had completely changed his world. I know that I have not as yet discussed all of his inventions in my home page, but even the ones that I have mentioned -- the repelatron, the Cosmotron Express, the Dyna-4 Capsule, the anti-gravity gas, the Triphibian Atomicar, and the atomic power capsule -- show that his world would have been completely changed.

Therefore, I think that something should be done. Matters should not have gone this long without someone addressing them. One of two things should be done:

1. This book should be re-written to satisfy Tom Swift Jr. collectors everywhere and republished, or
2. Another book (#34) should be written and published that will finally and satisfactorily end the series.

There are, however, many (mostly legal) problems associated with this. Recently, I received the following e-mail from the Tom Swift expert **James D. Keeline** that helped highlight the problems with putting out a new book:

Like many other series books, the Tom Swift Jr. series was produced by the Stratemeyer Syndicate. Today, we would call this entity a "book packager". As you probably know, the Syndicate hired writers to complete book-length manuscripts from brief outlines -- ranging from a couple of sentences to several pages. For this effort, the ghostwriters were paid a flat fee for all rights. Between 1904 and 1984, the Stratemeyer Syndicate produced over 1,600 series books. Some of which were very popular and others are all but forgotten today by the general public. Ever hear of the White Ribbon Boys series? Edward Stratemeyer, who founded the Syndicate, died in May 1930. Thereafter, his two daughters, Harriet S. Adams and Camilla Stratemeyer Squier continued the business operation. Camilla withdrew in 1942 after her marriage and became a silent partner. Harriet continued to run the Syndicate until her death in 1982. The Syndicate was run for a couple of years by the junior partners who were around. However, they decided to sell the company to Simon & Schuster in 1984. All of the existing series were stopped. Some were resumed (like the Hardy Boys and Nancy Drew series) under the new Minstrel imprint of Simon & Shuster. When the Syndicate was still in operation, these titles were published under the Wanderer imprint. Eleven Tom Swift stories were published between 1981 and 1984 under the Wanderer imprint.

Nearly three-quarters of the Tom Swift Jr. series was written by James Duncan Lawrence (1918-1994) -- specifically volumes 5-7, 9-29. Other authors wrote the remaining volumes. The volume you mention, TOM SWIFT AND THE GALAXY GHOSTS (1971) was written by Vincent Buranelli, who also wrote some Hardy Boys books during that time period. This was his only Tom Swift book. I think the Syndicate was in a state of denial and did not believe that the series would end at this point even though they did not announce a new title at the end of the story.

There were several reasons for the demise of the series. First, the Baby Boom Generation had outgrown the books. The same children who made the series a virtual best seller in the 1956 to 1961 time period were approaching 20 by 1971 -- far too old to be interested in Tom Swift Jr. There were fewer children born after 1952 and many of these would be entertained by television of the 1960s rather than series books. The sales of all series books plummeted at this point. It killed many series before 1971 (Rick Brant in 1968, Ken Holt in 1964, etc.).

Second, the Tom Swift Jr. vision of the future was not borne out by reality. I contend that not one of the major inventions in the Tom Swift Jr. series was realized in any form in the real world. This is unlike the original Tom Swift series where nearly all of the major inventions were realized in some form or another ... Synthetic Diamonds, Picture Telephones, Television, Motor Homes, etc. By 1969, the Saturn V rocket, not Tom Swift Jr.'s gyroscope-shaped Challenger, was the vehicle that took men to the Moon. Even the premise of the "scientific background" for the series has not seen reality. We did not expect to have Tomasite. However, we also don't have a repelatron either. The repelatron was the basis for many of the Tom Swift Jr. books. They were science fantasy -- not science fiction as they are often described.

Simon & Schuster has published two Tom Swift series. The one from 1981 to 1984 and another, better series published between 1991 and 1993. Even though some of the titles were ridiculous, like CYBORG KICKBOXER, the stories went back to the original Tom Swift mantra -- extrapolate on ideas in current science publications and popularize the ideas. When superconductors were in the news, Tom was making a hoverboard out of it. In one case, when I read the latest story MOONSTALKER, it described a computer-controlled mirror to adjust for the atmospheric disturbances. After an all-night read, I woke up to the morning newspaper to find that scientists at Lawrence Livermore Laboratory had performed a similar accomplishment using the same technique described by "Victor Appleton."

Both Tom Swift series were not popular with young readers. They did not sell well and are sought only by fans of the other two Tom Swift series. Simon & Schuster has given up on publishing new Tom Swift stories but they are unlikely to look the other way should someone try to publish a new story based upon characters whose trademarks and copyrights they own. Even though the story would be new, there would be a trademark infringement through the use of the character names and situations.

Simon & Schuster, through its permissions department and Kevin Sullivan, have sent strong letters to editors of hobby magazines, like THE WHISPERED WATCHWORD when they ran an article psychoanalyzing Syndicate characters. Rather than viewing this as parody (which is generally protected under the first amendment and existing copyright law), they saw it as a trademark infringement. In the end, nothing came of it. However, the trademark laws require the owner to "vigorously defend" their trademark properties lest they slip into the public domain through common usage. For example, the Baum family did not have a role nor did they object to the 1939 MGM film. As a result, there isn't a trademark for the Oz characters. However, the Burroughs family has worked pretty closely with any films using the Tarzan character, preserving their trademark. It's much more complicated than this and I don't begin to understand it all.

Going the official way with S&S's permission department is tough too because of the stiff licensing fees they require. Bob Cook, who published a TOM SWIFT AND HIS AMAZING WORKS CATALOG had to pay a fee to S&S and is only allowed to publish 900 copies of his Catalog. The

only thing he uses is the name Tom Swift, a couple of photographs with thumb-nail sized photos of the book covers, and the list of titles in English and foreign languages. He does not like to disclose the amount, but it was high enough to discourage me from continuing work on my own TOM SWIFT "COMPLETE" ILLUSTRATED BIBLIOGRAPHY which had much more article content describing the history of the series, production methods, unpublished titles, etc.

Karen Plunkett-Powell had to pay licensing fees for the photographs in her NANCY DREW SCRAPBOOK (St. Martin's Press 1993?). It's a tough nut to crack. In the end, could a satisfactory conclusion to the series be written by someone who had nothing to do with the original series? Would anyone care? Vincent Buranelli is still alive, though getting up there in years. Most of the other Tom Swift Jr. ghostwriters, including James Duncan Lawrence, are deceased. It is a different situation from the leftover manuscript by Hal Goodwin for the Rick Brant series --which took about 5 years to sell 1,000 copies -- not good.

I have many internal documents from the Syndicate describing the profiles for the characters, locales, etc. But until you get some sort of permission, there isn't much of a point.

James D. Keeline

This letter does a good job of pointing out the difficulties of giving the series a satisfactory ending. What can be done? I, for one, am not sure. The series still needs a good, solid ending, but it looks like the legal side of the matter will prevent this from ever happening. Any ideas, anyone?



The Dig Allen Space Explorer Home Page

Hi! If you're interested in the rather obscure Dig Allen Space Explorer series, then you've come to the right place. For those of you who haven't heard of this series, I'll give a little background. The six volume series, which is set in the 22nd century, chronicles the adventures of a three-man team of teenage space explorers. The series first appeared in 1959, but for various reasons, it failed to sell well and its last volume was published in 1962.

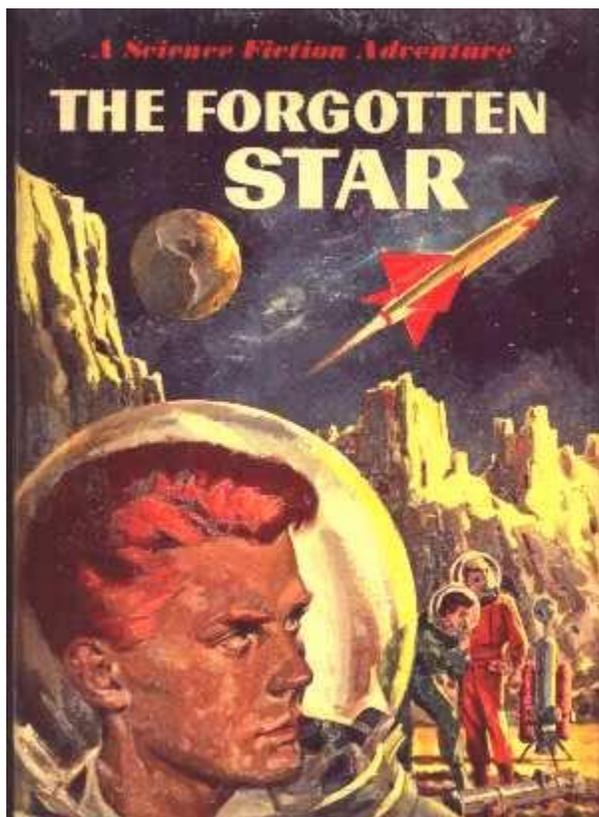
Information on this series has been nearly impossible to obtain. From my own experience as a collector, though, I have found some little information, which I am publishing here. Please bear in mind that all of this has been gained from personal experience, so there could be an error here somewhere.

The Dig Allen series is composed of the following books:

1. The Forgotten Star (1959)
2. Captives in Space (1960)
3. Journey to Jupiter (1961)
4. Trappers of Venus (1961)
5. Robots of Saturn (1962)
6. Lost City of Uranus (1962)

In the following pages you can find reviews of these scarce volumes.

#1. The Forgotten Star (1959)



Summary: All of the Dig Allen books come with a picture printed on the cover of the book. This first book (and *only* this first book) is available in a dustjacket. (The picture to the right is a scanned image of my dustjacketed copy. If you look closely, you can see that it has some pretty peculiar damage to it. Still, it's a far sight better than nothing.)

The dustjacket has a nice, fairly long summary of the story that I have copied here, for your own personal use:

Here is an exciting tale of action and suspense, set in the world of tomorrow. As the story opens, two brothers, Jim and Ken Barry, are traveling by space ship from Earth to a new city on the moon. Aboard the space ship they discover a stowaway, young Dig Allen. Almost at once the three youths are plunged into an adventure that threatens to spell destruction for them all.

Dig has set out to find his father, a space scientist who mysteriously disappeared months before. The Barry brothers agree to help Dig. Their search takes them to the "Graveyard of Space" and to Mars. There they meet

Old Dorkas, the one person who is able to decipher the last message received from the missing man. Finally, the boys are forced to set out along in an unauthorized space ship. They soon find themselves marooned on a weird, forgotten world at the outer edges of the solar system -- where unknown to them, their greatest adventure is about to begin!

A Short Overview

"The Forgotten Star" is, of course, the first book in the series. The book acts as kind of an introduction to the series. In this first book, all of the major, reappearing characters of the series (Jim Barry, Ken Barry, Dig Allen, Boyd Allen, Old Dorkas, and Sergeant Brool), are introduced. The state of the civilization -- both socially and scientifically -- is set forth, and a good feel can be had for the general state of things.

The general plot for the book is quite straightforward -- Jim, Dig and Ken all go to the satellite Eros to rescue Dig's father. Once on the satellite, they find out that Eros is not a natural asteroid at all, but instead had been hollowed out and converted into a huge, sprawling spaceship -- complete with natives. After rescuing his father and being made a Space Explorer, Dig's father moves his team of scientists to Eros and proceeds with unraveling the satellite's secrets.

This book definitely gives the most detailed account of the artificial satellite Eros that is found in the series. No other book hints at Eros' true size or immensity -- or science. Eros houses several devices that are definitely scientific mysteries. Its basement, for example, houses hundreds of gigantic machines (which later books call nuclatomizers) that can disassemble atoms and then recombine them to form whatever they wish. The steel elevators are quite odd, too -- somehow they can pressurize to normal Earth atmospheric pressure without the use of air vents or any other openings through which air might be let in.



The satellite Eros was, according to Dig's father, a huge spaceship, capable of going "at least as fast as light". It seems that the Asterians, as they were called, constructed it to journey to some far-off location. However, the journey took such an extraordinarily long time that the Asterian population housed inside the asteroid crumbled and reverted to a primitive state, living as savages off of a forest housed deep inside the asteroid. Why the civilization crumbled is not hinted at in this book, but one can take a good educated guess as things.

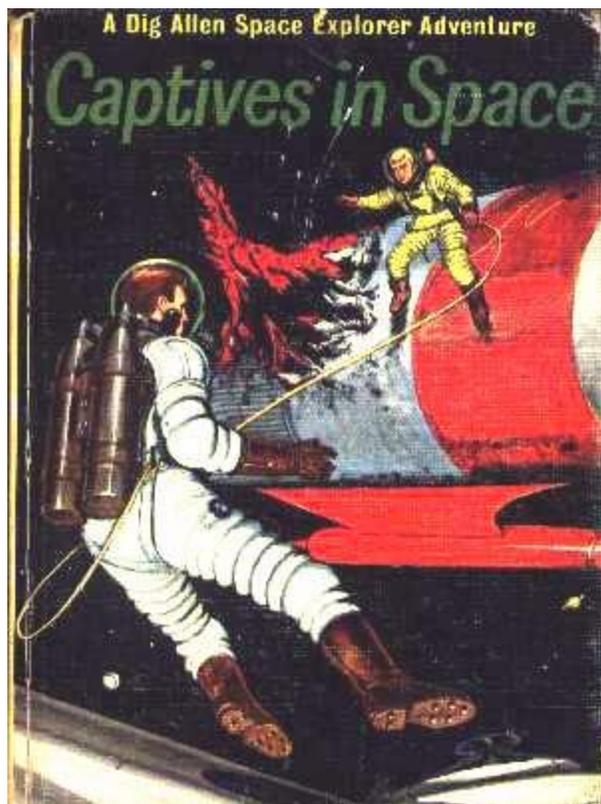
The title of the book does not, in fact, refer to the satellite Eros itself, but instead refers to the home of the Asterians. It seems that, although many "star charts" were provided on Eros, none of them could be reconciled to the currently known stars. Thus, said the book, the Asterians were from some "long forgotten star", which, I suppose, they were.

Rating: ★★☆☆☆

3 stars out of 5. This is an enjoyable book which introduces both the characters and the world of Dig Allen. Normally the first volume of a series is the most thought-out and imaginative, but this time that is not the case. Like the rest of the books in the series, this title wins high marks for originality and creativity: back at the time of Sputnik and before Star Trek and Star Wars the author had created a world of interplanetary commerce, nuclear rockets, lunar settlement and the Graveyard of Space. The asteroid Eros, which was really an interstellar spaceship in disguise, was a brilliant idea which was made better by having its builders still housed inside unaware that they were on a spaceship.

However, the book could have been better. The characters act somewhat implausibly, and the plot is not as well-developed as the plot in later volumes. The book lacks the coherent excitement present in the other volumes, and the Asterians are hard to take. Overall, it is a good book to read to become familiar with the beginnings of the characters, but the later volumes are better.

#2. Captives In Space (1960)



Summary: In this story, the three new space explorers come upon an old, seemingly abandoned freighter with an unstable atomic reactor aboard. Through radio contact with the ship they find that the freighter still has a few passengers aboard. Through a smart scheme of their own the Explorers manage to save the freighter and find its 3 inch tall inhabitants. [A picture of these inhabitants is posted on the index.]

After bringing the inhabitants to Eros and learning the creature's language through Boyd Allen's amazing new computer that can translate any language and imprint it into the mind, the Space Explorers find that if the creatures are not returned to their planet soon they will die. After finding of their home planet through the use of the Observatory, the two creatures are returned home.

Upon arriving at their home planet, however, the Space Explorers discover a band of ruthless men that are burning their cities and capturing hundreds of the creatures. It is up to the Space Explorers to see if they can stop this ruthless band of men and return order to the once peaceful planet.

An Overview

This book basically continues the story that *The Forgotten Star* began. The book begins with the three space explorers (Jim Barry, Ken Barry, and Dig Allen) returning to the newly-discovered asteroid Eros (which is now their home) after a thorough studying space flight and all it entails.

This book, in my opinion, is the best book of the series. No other book can match its artwork, or its story, or the book's execution. If you only had a chance to read one of these books, read this one. Sure, it's not completely scientifically accurate -- Mercury, after all, does NOT always keep one of its faces toward the sun but rotates as any other planet would.

There are a number of rather intriguing points that come up in this book. The first thing that comes up is the **Langivac**. The Langivac is a computer that can 'embed' any language it knows into the mind of a person in such a way that he can speak it without difficulty, and can remember it for some time to come.

When the Explorers wanted to learn the language of the aliens, all they had to do is get the alien to recite all the words for different nouns, adjectives, pronouns, and other parts of speech. A picture dictionary was brought out, and as the alien looked at each picture he would recite the word for that object or action. The machine would then pick up on that, and after it had enough information it would gather its information together. Once it was ready, the person who wished to learn the language was put to sleep, and while he was asleep the machine "wrote" the language into his brain.



The idea of such a machine is quite an interesting one. Wouldn't it be nice if you could learn French or German or Chinese without any effort at all on your part? For that matter, it seems that you could learn *anything* this way. Simply get the facts together, haul out your Langivac, and let things roll. Rote memorization of facts would be a thing of the past.

I need hardly say that this machine won't be appearing at your nearest wholesaler any time soon. True, the idea doesn't break any physical laws, but it's impractical, all the same. How do you "write" knowledge into a person's brain? How does a person's brain store information, anyhow? How can a computer "figure out" a language? These are crucial questions that must be answered before such a machine can be made. Maybe in a few hundred years these problems will be solved, but until then, we'll have to stick with learning things the old way.

In the book (as in much of science fiction at the time) science seems to have stalled at the 1960 level. Ships still went tiresomely slow. Nuclear power still posed the same problems as it did in the 1940's, and the ancient art of nuclear fission was still practiced in the exact same way as it had in the 1950's. Biology seems to be the only science that has advanced at all, and boy, did it ever advance (remember the Langivac?).

Another point that crops up in the book -- which ties in closely with what I just said -- really reflects the totally unpredictability of science. In the book, the little green men were needed to put machines -- most notably computers -- together. It seems that, in 2100, computers, control panels and the like were made of huge tangles of wires and connectors. Connecting those wires by hand was very difficult. The little green men, however, could do it relatively easily, quickly, and accurately, which spelled increased profits to the computer makers.

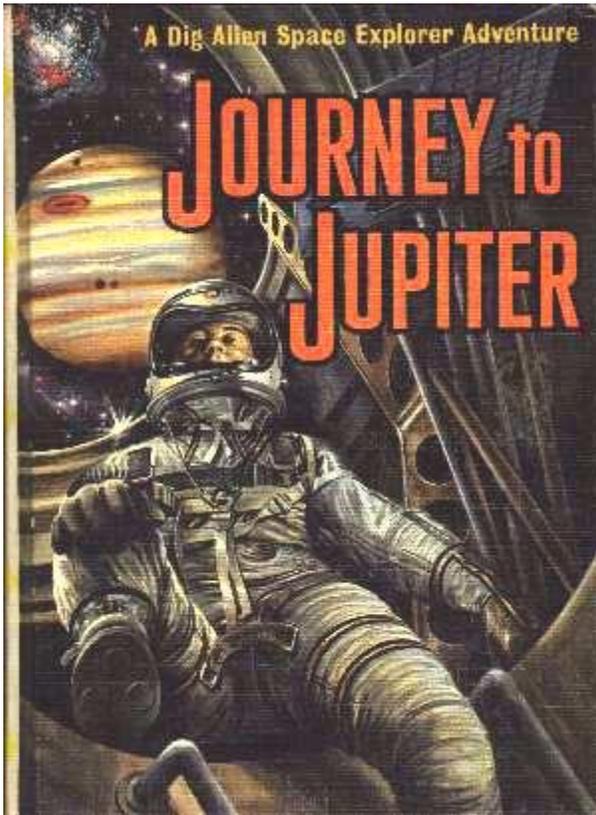
This prompts a question. Why were the computers of 2100 still using large copper wires? Where was the author's vision, or insight? Couldn't the author of the book see that, in just 10 short years, the microchip would be invented that would enable entire computers to shrink to the size of a postage stamp, or a deck of cards? Of course not. Microelectronics was not even conceivable before it came about. No one could foresee huge, monstrous computers that took up entire rooms shrinking enormously while becoming thousands of times faster. It just wasn't conceivable. It was a physical impossibility -- until it happened.

So many old science fiction books I have read have had this same flaw. Spaceships to Venus sent messages by rolls of tape -- not electronics. Radios and computers still worked on vacuum tubes. It just goes to show, really, that we cannot predict the future of physical science with any kind of accuracy. Just because it is impossible today does not necessarily entail that it will remain impossible. Science fiction books have been, and will continue to be, inaccurate. But, hey, if they weren't, wouldn't it be a dull world?

Rating: 

5 stars out of 5. This is an excellent book: in my opinion it is the best of the series. The book starts out with an exciting opener, and it keeps the suspense high until the satisfying end. The dangers are unique and creative, and the cast of characters and locations are at their best. The little green men were a brilliant idea, and their home was a fantastic piece of insight: it's a shame he was proven wrong...

#3. Journey to Jupiter (1961)



Summary: The following summary was extracted from the back cover of the book. True, it's not very long, but it is the only one that was provided, and as it is both very informative and very uninformative at the same time, it will have to do:

Dig Allen and the brothers Jim and Kin Barry are sent to Ganymede, one of Jupiter's Moons, to investigate trouble at a colonization project. A desperate race against a gang of criminals--who plan to claim Ganymede's fabulous diamond deposits--takes the three young Space Explorers on one of their most dangerous assignments.

An Overview

Journey to Jupiter is the third volume in the Dig Allen Space Explorers series. The series starts out when the team of Space Explorers return from the planet of the little green men (no, not Mars) to get a new assignment from Eros. Once on Eros, they find out that the Langavac (a fabulous machine that can translate a language and embed it into anyone's mind) has translated enough records to enable the scientists to create a device called a **nuclatomizer**.

A nuclatomizer is a machine that, in simple terms, can take apart matter and reassemble it, theoretically, into anything that is desired. Earth, however, has only figured out how to create Oxygen, Hydrogen, Carbon, and Nitrogen -- five rather simply built but very commonly used atoms. The plan was to use these magnificent machines to create an artificial atmosphere in Ganymede.

Doing this, however, was a really big challenge, even with the nuclatomizers. If you can't think why this would be, think of the size of Ganymede for a minute. Ganymede is, I believe, the biggest moon in the entire solar system. It is so big that it has its own atmosphere and its own magnetic field -- something that very, very, very few other moons have. Given this, it would take hundreds of nuclatomizers to create and

maintain an atmosphere for Ganymede (and it would have to be maintained -- Ganymede doesn't have enough gravity to keep a livable atmosphere).

What was done, then, was this: a valley with a very, very steep hedge of mountains around it was found, and the colony was placed in this valley. Four or five nuclatomizers were then built in the valley, and an atmosphere was slowly created. Because of the high mountains that surrounded the valley the atmosphere would only leak out after enough air was poured in to keep the atmosphere -- and atmospheric pressure -- what it should be.

Another benefit of the nuclatomizers is the fact that they, if desired, can change their output to electrical energy instead of gases. This opens up tremendous possibilities for the machine, especially since the machine can use any piece of matter for fuel. Just think about it -- station one of these things on a planet, and you will have an incredible amount of electricity at your disposal. Earth could use a few of these too -- the planet would no longer have to depend on depleting fossil fuels or uranium supplies.

The book isn't too far off when it pegs the date all this happens at the year 2100 -- or, in other terms, a hundred years away. It is already possible to heat atoms to such a temperature that the very electrons of atoms are ripped apart from the nucleus, thus effectively disassembling them. Isn't it reasonable to say that, given a hundred years, we could figure out a way to put them back together?

Maybe we won't need to find our own Eros to figure this one out.

The last thing that I want to comment on before I close is the brilliancy of the Explorer's plot to ruin the mutiny on Ganymede. I, personally, *never* would have thought of it. In case you hadn't read the book, here's what had happened: The valley the colonists landed in had some very, very rich diamond deposits, and a gang of mutineers, greedy for diamonds, locked the colony up into its buildings. The Space Explorers, however, managed to get locked up inside the nuclatomizer control room and then changed the nuclatomizer's output from atmospheric gases to diamonds -- diamonds of extraordinarily large size. (Diamonds, you see, are made under tremendous heat and pressure from pure carbon -- and nuclatomizers can create carbon in abundance).

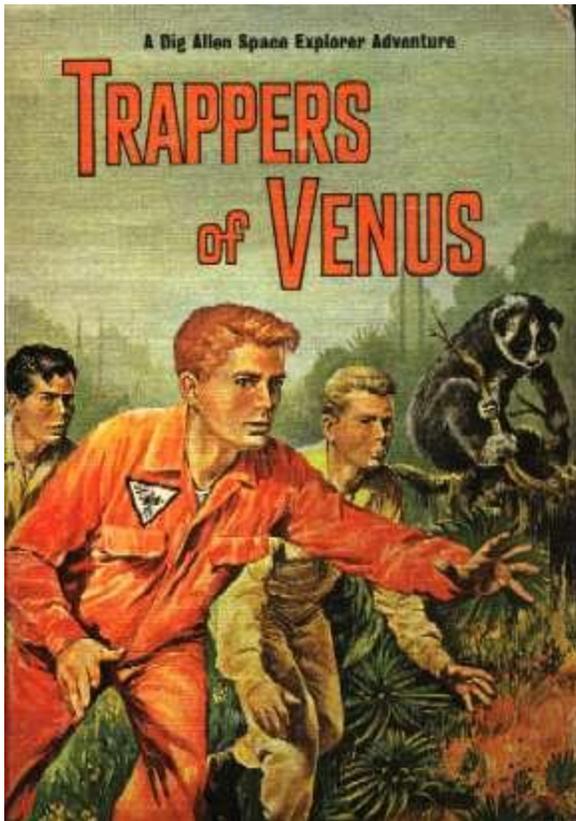
When daylight came around and the mutineers were going to blast off and leave the colony to starve they caught sight of the enormous quantity of diamonds that were pouring out of the machine and went insane with greed. They completely abandoned their leader and tried to grab as many diamonds as they could. The mutineers soon started quarrelling, however, because each suspected the other of having a richer cargo of diamonds. During the confusion, the Space Explorers managed to escape from the nuclatomizer control room, round up the ringleader, and then squash the revolt.

Now tell me -- who would have thought of that? I thought that that was a pretty clever way to squash a mutiny...

Rating: 

4 stars out of 5. This is another excellent book: it is one of the highlights of the series. The author had a very thought-out plan for colonizing Ganymede, and his nuclatomizer was a brilliant idea that was ahead of its time. The suspense in this book is well done (although not as well done as *Captives in Space*) and the climax when the Space Explorers conquer the pirates through their own greed is one of the highlights of the series. I would definitely recommend reading this book; it is worth the time and effort.

#4. Trappers of Venus (1961)



Summary: The swamps and wildlife of Venus are in trouble, and Tim Buckle has come to enlist the Space Explorers to their aid. Trouble arises, however, soon after Tim lands on Mars: a henchman throws him into the chilly Mars Canal -- an act which means almost certain death to a man who has spent his life in the swamps of Venus. Dig tries to help him, but the dunking made Tim go insane: he and Dig blast off to Venus and leave Ken and Jim stranded.

The henchmen who tried to kill Tim take advantage of the situation and convince the other two Space Explorers that Dig has deserted them for being "space Jonas." Their only choice now, he convinces them, is to resign their commission as Space Explorers throw their lot in with Linton Wells, a rich businessman. Wells wants the two Space Explorers to certify the Venus Kohoolies as being non-intelligent so that he can begin killing them and exporting their skins.

Soon both parties are plunged into danger: when a riot stirred up by Linton Wells' henchmen fails to eliminate Dig and Tim, Linton starts a massive manhunt to find them. Jim and Ken soon find out that they had been duped and rejoin Dig -- but Linton manages to recapture them. Things take a sudden turn for the worse when all Dig, Jim and Ken are caught by the Mist Flower and injected with the flower's fatal venom. Their only choice now is to journey to the intelligent Kohoolies' secret city to be treated by their doctors -- for the fate of all Venus rests upon them!

An Overview

The following overview was provided by Thayne Harmon, a loyal Dig Allen fan. Thanks a lot!

The fourth book in the Dig Allen series takes place mostly on Venus, a place of a hot humid tropical jungle filled with various wildlife. It starts out with a secret meeting on Mars. Dig receives a message to meet Blind Old Dorkas's companion Chips at the edge of Spaceman's Roost, a bad part of town, where criminals and old spacemen find hiding. Dorkas has asked that Dig help a Venusian trapper, Tim Buckle, who has come to Mars to

find help to save the Kohoolies, a supposedly intelligent animal of the planet. When they arrive at the shack where Tim is hiding they find that some henchmen have already arrived to convince Tim not to pursue his quest. Tim ends up in a Mars canal with cold water which is deadly to the Venusian trapper who has lived in the steamy jungles most of his life. Chip and Dig rush him to the Starover, Dig's ship, where the climate is change to match Venus.

However Tim goes mad with fever and Dig soon finds himself tied up and headed out in space away from Venus because Tim has not made proper corrections. Dig finally convinces Tim to let him lose to make corrections for Venus.

Meanwhile, Dig's space buddies Ken and Jim Barry are on the asteroid Eros visiting parents. A Trader named Linton Wells and his son Chuck are trying to get Space Research to send a Space Explorer to the planet Venus to make a report that the Kohoolies are not intelligent so that the Trader Wells Company can mine the furs from the planet and kill the Kohoolies. Ken and Jim contact Dig and are going to meet him on Mars to decide to go or not. They ride in Wells ship to get there only to find that Dig has left them. This has made them space-Jonahs, which are bad luck. Wells through his partner Jud Hanker convinces Ken and Jim to resign there Space Explorers commission and to sign up with Wells. Unbeknownst to them Hanker never sends the resignation so he can use the Space Explorers to make the report on the Kohoolies and have it be valid. For Wells to mine furs on Venus, the planet must be declare 'free' by a Space Explorer and a report given to the Space Research Bureau and the World Council.

Dig contacts Wells ship which is headed to Venus to let his friends know that he is alright, but is unable to tell them why he ditch them because Tim will not let him. Chuck Wells, a spoiled brat, over hears and spreads the shame throughout the ship.

Dig and Tim land on Venus, they find Venustown infested with scorpion lizards, with the towns people believing that the trappers Pierre and Peter, friends of Tim's, are responsible and have thrown them in jail. The mob spots Tim and Dig and also wants to put them in jail. They notice that Dig is a Space Explorer and Dig is able to talk their way out by promising that Tim will get rid of the scorpions. Tim leads Dig into the forest in search of the Kohoolies who then help rid the town of the scorpions. Gorgon, working for Hanker, still won't let Pierre and Peter loose.

Tim sets fire to a Trader Wells building, and Dig trying to find out what Tim has done is nearly caught, and falls near the jungle's edge and is dragged into the Jungle by a Kohoolie.

Wells ship lands and Jim and Ken see the Starover. Wells finds out that Tim did not take a bribe and is here, Jim and Ken find out that Dig is here also. The Wells group sets up camp in the jungle and burns the old buildings that are there. Jim and Ken are not allowed to leave.

Dig and the Kohoolie are treed by some big boney pig like animals that were working at knocking the tree down. The Kohoolie jumps out of the tree and leads the beasts off into the jungle where they are trapped by a tree with stinging limbs. Dig sees the burning of the

old huts where the Wells camp is, they go to investigate, he sees his friends, but they don't see him. He asks the Kohoolie to help get them out. The Kohoolie gets caught to get into the camp and Jim and Ken take the Kohoolie into their tent. Wells wants his report quickly that they, the Kohoolies, are not intelligent, and so they test the Kohoolie. They take a preliminary signed report to Wells who says he can change it to make it a final report and gives the resignation letter back to Ken, who is confused and mad at the trick. He goes back to the tent where the Kohoolie helps them escape out the back of the tent stealing Well's briefcase also. They are noticed and are pursued; they get away and meet up with Dig at a stream bank.

They run through the forest and then get caught by the Wells group, where the Kohoolie gets shot. They head back to camp and get caught by a poison mist flower. Chuck and the Space Explorers remain caught as the rest of the group leaves them, as there is no way to get them loose. The Kohoolie survives and revives; He finds the boys in the mist flower and calls for help from other Kohoolies. The Kohoolies come and save them by cutting down the tree that the flower lives in.

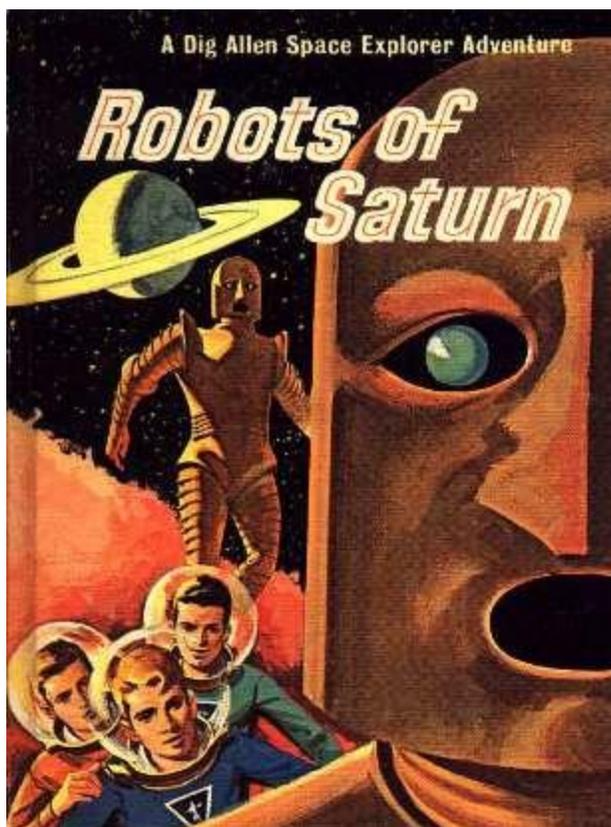
The Kohoolies take the boys on a raft down the river to a lake and an island in the middle, their city. The boys go under water to enter the city. The Kohoolies make a cure for the mist flower's poison and they are cured. The Kohoolie ruler talks with Chuck find out if they can live in peace on Venus. Chuck agrees that the Kohoolies are intelligent and that he will convince his father of it.

They reunite with Chuck's father, at camp, who has had a change of heart and decides to leave Venus. Hanker revolts and takes the briefcase with the signed report and has Gorgon throw them in a shed with scorpion lizards. Chuck jumps in first, saying that they are immune because of the cure for the mist flower; they however are not. Chuck's distraction gives the space explorers the chance they need to rush Hanker and Gorgon; they escape out of the shed closing the door and leaving Hanker and Gorgon in the shed with the scorpion lizards. The shed door crashes open and Hanker and Gorgon come out with the briefcase and bloody hands from being stung by the scorpions. The Kohoolies take them to Kohoolie city to save them. Chuck admits that he has learned something from the space explorers; to care, Wells says they will not hunt here. They have a feast and leave for home the next day.

Rating: 

3 stars out of 5. This is a very enjoyable book. The author did a wonderful job of recreating the hot, tropical and deadly Venusian atmosphere. The book was different from the rest of the series in that this one mainly took place in a tropical jungle and had very little to do with the 23rd century or space travel, but the change of setting was a good one. The only reason I gave this book three stars instead of five was because while this book was good, I thought some of the others in the series were better. In my opinion, it is not the best Dig Allen but it is a good and a very imaginative Dig Allen.

#5. Robots of Saturn (1962)



Summary: In their most daring venture yet, the three Space Explorers set out to mine the rings of Saturn! An expedition to the planet discovered that the rings of Saturn are the only place in the Solar System where Methane-X can be found -- and Methane-X is the key material Space Research needs in order to build an interstellar spaceship.

But mining the rings of Saturn is too hazardous a task for human beings: the ice flows in the Rings would kill any ordinary human being. The brilliant Professor Norwyn, however, has come up with a solution: the M-Robots.

M-Robots are no ordinary machines: they are fantastically powerful robot bodies. With the right equipment, Professor Norwyn can transfer the consciousness of a human being into the robot. Once the person is transferred, the person can see through the robot's eyes, move the robot's body -- and has the robot's invulnerability, which is critical to carrying out any mining expeditions.

At first everything goes well at Saturn and the Space Explorers are able to get a valuable cargo of the Methane-X gas. But soon things go awry: the Explorers start glimpsing other golden robots -- robots which couldn't exist -- and then the entire crew disappears. Soon Dig and Ken find themselves battling a horde of sentient, intelligent robots -- robots under the command of Professor Norwyn, who seems bent on destroying them all!

An Overview

Thayne Harmon has e-mailed me a two-part overview of this book! I am very glad to at last have an overview of this fine book to post on the website. Thanks a lot! Without further ado, here is the review!

Robots of Saturn - Overview

The following is a chapter-by-chapter overview of the major points of the book, courtesy of Thayne Harmon. It is followed by a review of the book.

- 1) Signal from space
 - a) The boys receive a message from their father to meet him at an asteroid in the asteroid belt.
 - b) The message has a time but no date ñ this really would not have happened as it would have been automatic.
 - c) They get their first view of the Golden Robots

- 2) The Man-Robots
 - a) The technology is maybe not as future looking as it could be, yet the technology to transfer the mind to a robot body is defiantly future looking.
 - b) The idea of controlling mechanical device using brain waves is certainly a doable thing today.
 - c) The boys learn that they are going to Saturn to mine the rings for material call methane X from the asteroid Eros.
 - d) Maxie, one of the men using the robots is lost in the asteroids.

- 3) The Secret Enemy
 - a) They spread out and look for Maxie, Dr. Barry consoles Prof. Norwyn.
 - b) Maxie is able to transfer his self back to his body.
 - c) Maxie says he was hit by an electric bolt bomb.
 - d) Dr. Barry believes it is to stop his going to Saturn.
 - e) P. Norwyn believes it is to steal his robots.
 - f) A transmitter is found and reports were sent on the robots testing, it was set to go off automatically.

- 4) Lost Robot!
 - a) Greg transfers into Maxie's body so that the space explorers can home in on his radio signal.
 - b) They discover an Emergency call transmitter set to go off in 3 months.
 - c) The robot was not lost but hidden.

- 5) The Rings of Saturn
 - a) Negative matter on Eros the asteroid spaceship was discovered and the reason for going to Saturn's rings to mine the special material.

- b) Methane-X, Metalex is the material that is used to power Eros, the asteroid spaceship.
 - c) They head for Saturn, they will arrive there first, the sled is in the cargo hold to help with the exploring.
- 6) The Cassini Space-Gap
- a) They reach Saturn and start looking for the guide signal on the inner edge of the first ring or outer edge of the Cassini gap.
 - b) They find the guide signal and park the ship; they head out with the sled into the thick of the ring to find base camp.
 - c) Fresh footprints are seen in the snow on the ground by the huts.
- 7) Into Saturn's Rings
- a) The beagle arrives and the man-robots are setup in camp.
 - b) Dig Allen takes Maxie's place in the Robots.
 - c) A spear is used to test for the methane-X, Dig transfer into the Robot body.
- 8) Search for X
- a) They find that methane-x is under the surface and that it evaporates from the surface.
 - b) The ice sample that Dig brought back had very little methane-x in it; it had evaporated.
- 9) The Phantom Robot
- a) They decide to use a plastic bag to move the ice.
 - b) The professor bursts out with an angry call of taking his robots of going to the sun with them.
 - c) They begin mining the ice digging a tunnel.
 - d) Dig sees a robot a footprints leading away from the tunnel.
 - e) Dig mistrusts Greg for suggesting that he is seeing ghosts.
- 10) Danger in the Ice
- a) Jim and Greg bring in the ice. Dr Barry starts making metalex.
 - b) An electric bolt bomb is tossed into the tunnel and the tunnel melts around them and the robot bodies become lifeless.
 - c) Greg transfers himself back to his body.
- 11) The Ice Coffin
- a) Jim transfers himself back to his body.
 - b) The robot bodies are buried in the tunnel.
 - c) Ken and Dig go to try and free the robots and navigate the ice field.
 - d) They get caught under a snow ball and almost get squished; they cut themselves out.
 - e) They find the robots and cut them free.
 - f) They find ECTs on them set for two weeks.
 - g) The camp is deserted.
- 12) Ghost Camp
- a) Ken and Dig find the oxygen tanks empty, the amplifier gone, and the air compressor disabled.
 - b) They cannot raise anyone on their helmet communications.
 - c) They transfer into the man robots which were still at the dig site and headed for the beagle.
 - d) They run into other robots aboard the Beagle.

- 13) The Saturn Robots
- a) Jim is taken to the beagle to recover with Greg, robot-shock.
 - b) The Sensitronic robots come aboard the beagle and take P. Norwyn and Dr. Barry away. They leave guards, saying there is danger to the humans.
 - c) Prisoners because of the 3rd commandment.
 - d) Maxie appreciated the cold logic of the S-robots; maybe there really was a danger here.
- 14) The Five Commandments
- a) Ken and Dig board the beagle and run into the S-robots.
 - b) The s-robots were making food for the crew.
 - c) They find Greg and Jim in the infirmary, where each share what they know is going on.
 - d) The 5 commandments:
 - i) A robot shall not harm a human being.
 - ii) A robot shall not permit harm to come to a human being.
 - iii) A robot shall not permit a human being to bring harm to himself.
 - iv) A robot must obey all orders given him by a human being, except when such orders break any of the first three commandments.
 - v) A robot must protect himself from harm, except when such action breaks any of the first four commandments.
- 15) Decoy
- a) The s-robots tell them to check in, they knock the s-robot out.
 - b) They leave the infirmary with the others, but are stopped by the s-robots.
 - c) Greg and Maxie throw themselves at the s-robots to slow them down while Dig, Ken, and Jim escape through the air lock.
 - d) The s-robots give chase, they head to camp.
 - e) Dig separates to lead the s-robots off while Jim and Ken escape to camp.
 - f) Dig dodges and runs for thirty minutes and then hides, hoping that the s-robots would pass by, however they stop, no trail, and begin to search the satellite.
- 16) The Hidden Spaceship
- a) Jim and Ken make it to camp and Ken gets out of the robot.
 - b) One of the s-robots had been waiting for him to come out of hiding
 - c) The s-robot tries to outwit him with words while buying time for the other s-robots to come
 - d) Dig and the s-robot begin to fight as dig tries to get away.
 - e) Dig manages to break the eye of the s-robot and gets away.
 - f) The other s-robots arrive and converse with master control
 - g) The others head back to the ship, the one with the damaged eye heads to the camp, Dig follows
 - h) The s-robot enters in a snow mound some distance from the camp
 - i) Dig finds that a spaceship was hidden under the snow mound
- 17) The Trap
- a) Dig goes back to camp and has Ken get back into his robot, they head back to the buried spaceship
 - b) Jim builds a radio-amp from the other space suits while he waits
 - c) They find a view port on the buried ship and see P. Norwyn working on the s-robot with the broken eye

- d) The fixed robot leaves, Ken and Dig enter into the ship
- e) They head for the control room and are caught, they are lead to the Dr Barry's lab to wait for professor Norwyn to repair them from thinking human

18) Robot's Choice

- a) Dr Barry recognized them to be Ken and Dig
- b) They are taken to P. Norwyn's lab which is next to the control cabin
- c) They try to break into the control cabin but cannot
- d) The professor is made, does not want them to 'save' them and said that the s-robots wanted them to return to their bodies
- e) Dig asks for the cutting torch, the professor was startled by the request, but goes to the closet to get it
- f) Professor Norwyn closes the door behind him.
- g) Dig suspects the professor because he had said that the s-robots wanted them to return to their human bodies, but how did they know.
- h) A s-robot comes through the control cabin door and throws a bolt bomb at the boys, Dr Barry dives to intercept, but the s-robot grabs the bomb from him and it explodes, the s-robot dies

19) Revenge!

- a) The professor goes mad raging about Dr Barry stealing his fame
- b) The professor agreed to help so that he could steal the metalex
- c) He wanted to make man-robots out of metalex and walk on the sun
- d) The professor grabs a bolt bomb and threatens to throw at anyone
- e) The professor throws the bomb it hits Ken and explodes
- f) The professor commands the s-robots hide the spaceships in the rings

20) To Walk on the Sun

- a) Dig and Ken transfer back to their bodies and disconnect as the professor throws the bolt bomb
- b) The boys returned back to their bodies and rose as a surprised professor and Dr Barry stared on
- c) Ken went to the control cabin and raised the ship
- d) Dr Barry forgives the professor and says they can continue to make the metalex man-robots
- e) The professor turns control back over to the ship crews and for the s-robots to obey them
- f) The boys return to their bodies, Greg and Maxie begin mining again
- g) Jim had painted Ken's and Dig's faces

An Overview

This is the 5th book in the series, and continues the story of Eros the asteroid spaceship and colony. Dr. Barry has found that there are thousands of metal plates buried just under the surface of the asteroid and that by applying power to the plates can cause a pull or push and that this is how the asteroid traveled. The plates had an unknown metal labeled metalex made from methane-x in them. Captain Boyd Allen, Dig Allen's dad had found that the methane-x existed in the rings of Saturn and had established a base camp for mining the material.

The World Council had asked Professor Norwyn to assist with his new man-robots; Robots that a human's thoughts could be transferred into and become the robot. This allowed for dangerous and other kinds of work to be done. Dr. Barry, Ken and Jim's dad ask them and Dig to come to Saturn and help. They arrive at the rings of Saturn first and

discovered strange things. After the main ship (the Beagle) arrives, accidents begin to happen; a man-robot gets lost and the man-robots get buried in ice. Dig and Ken rescue the man-robots from the ice only to find the camp deserted. They also find finder beacons on the man-robot's bodies.

They find that professor Norwyn has built S-Robots that have 5 commandments to follow and one is to protect humans from themselves. They have imprisoned the crews on the Beagle and are forcing Dr. Barry to make the metalex and Professor Norwyn to build another man-robot from it. Dig and Ken free the Beagle's crew and find out that it has been Professor Norwyn commanding the S-robots all along due to a grudge against Dr. Barry. Professor Norwyn wanted to send his man-robots to the Sun, and felt robbed by having to help Dr. Barry.

A Second Overview

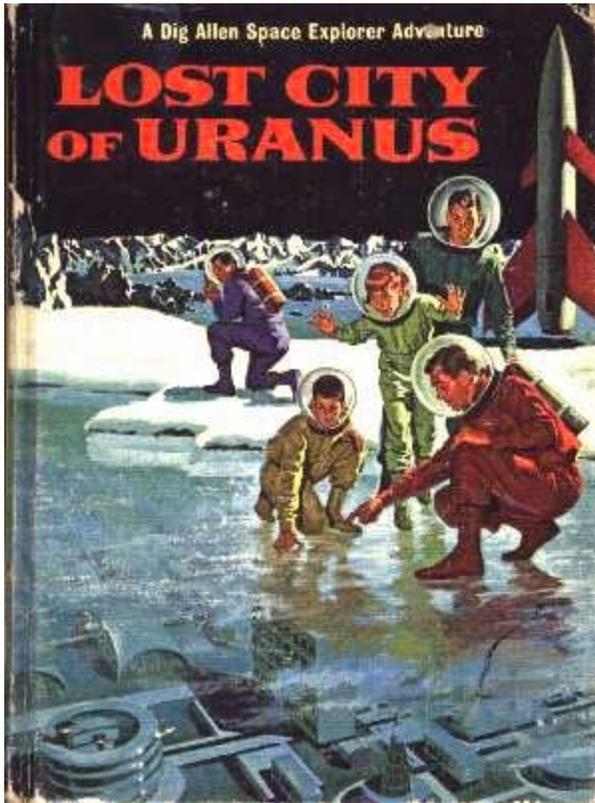
I enjoyed this book immensely, its cleverness, danger, intrigue, and possibilities. It is fast paced, with something happening all the time. The man-robots made the boys feel all powerful, being able to jump great distances with built-in jet packs and powerful fists that can crush blocks of ice. Then there are the Sensitronic robots with thinking minds of their own and commandments that protect human life over their own. They are not sentient, but close. The chase scene is intense and just when you think you got away you're caught staring at an S-robot in the face upside down. Ships buried in the hillside, and secret laboratories. All of this while floating in a grinding mass of ice and rock hanging over a huge gaseous planet in the rings of Saturn. It was just plain exciting. I found this book very plausible, the transferring of a person's mind into a robot to be very intriguing. Although this may seem fanciful, remember we can already manipulate synthetic arms and legs with impulses of the nerves. If all functionality was to be connected and manipulated, one could be seeing what the robots see and then with textile feedback manipulate the robots' arms and legs, etc. The going to Saturn and mining the rings is definitely doable once the space travel time issue gets resolved. They talk of negative matter, or anti-matter, imagine that, something that has been basically proven. The one thing that is disjointed is that of seemingly old technology being used to put in place quite futuristic ideas. There, the author perhaps lacked some vision or perhaps knowledge of what was in other people's minds for the future. I will admit that a lot of the technology has happened in the past few years, a cascading effect.

Thayne Harmon

My Rating: 

4 stars out of 5. This book is one of the most imaginative books of the series: the Methane-X, the mining expedition to Saturn and the fantastic M-Robots are brilliant ideas that are carried out very well. The story is well carried out, and the characters (with the exception of the mad scientist) are plausible. Keith Barry's strong leading role greatly adds to the book. The portion of the book when the sentient robots chased the boys through the Rings of Saturn would make a stunning visual, and the scene inside the rocket when the mad scientist tries to kill the boys is well done. I would recommend this book; it is one of the highlights of the series.

#6. Lost City of Uranus (1962)



Summary: This book does not come with a summary, so I'll try to write my own. Basically, this is what happens:

The story opens up when two men, while doing repair work on a ship in orbit around Jupiter, find a bottle floating around in space. The bottle contained a note written by a man just before his ship was going to crash on Uranus, and said that he saw huge, wealthy cities on the planet below him.

The note was then forwarded to the wife of the man who wrote the note, who then gave it to her two children. The criminal who found the note, however, lured the children to a smuggler's spaceship with the intent of stealing the note. While he was gone looking for a smuggler, though, the children accidentally launched the ship -- which had a course laid in for Uranus.

The 3 Space Explorers, along with the owners of the "stolen" ship, raced after the children to Uranus. Upon landing on Uranus and finding the children the Space

Explorers find that the note was right -- under large sheets of "ice" were huge, glistening cities.

The owners of the smuggler's ship were then to return to Earth -- but instead of doing so they faked the trip and landed on Uranus again. While the smugglers were in space, the Uranians met with the Space Explorers and invited them down to their city. The Uranians then brought them down to their only remaining city via an airlock in a mountain. They didn't dare drill a hole and bring them down that way -- for, as they explained, their city was covered by a living sheet of organisms that, if heated, would die and cause the destruction of their entire city.

While the Space Explorers were visiting the inhabitants of the city, the smugglers landed on Uranus again and quickly burnt a hole through the "ice". Once through, they started looting like mad. Even when it became apparent that the city was freezing the smugglers still would not leave behind their loot -- and thus they were killed, along with the rest of the fantastic city, when the organisms they had killed finally died.

An Overview

This sad story, unlike the others that I have covered, has no scientific gadgets to review. It does have some interesting points, and scientific inaccuracies, though. I'll deal with the mistakes before I get on to the actual story itself.

For the first mistakes, let's look at the cover of the book. Let's ignore, for the moment, the fact that that particular scene never occurred in the book. The first thing that hit me was the fact that the Space Explorer's hands are out in the open -- despite the fact that the surface temperature of Uranus was hundreds of degrees below zero. Their hands would almost instantly freeze if left out in that kind of weather! And yet there they are -- on Uranus without even gloves. Something is definitely wrong.

The cover also has distance problems. The city is located many miles below the city of ice -- one character in the book said that he felt like he was flying high over a vast city on Earth. The cover, on the other hand, makes it look like only a few hundred feet separate the Explorers from the city. There is also the problem of the spaceship. According to the book, it was quite a hike from the spaceship to the portion of ice that held the giant city -- and yet the cover makes it look like it was only a couple hundred feet. The mountains, too, were many miles away -- but there they are, right there in the background. There is also the problem of the missing beach. The city was located in the middle of a huge field of "seaweed" -- not right up next to the lake edge. The cover, however, does not reflect this fact.

There is also the problem of the mysterious sinking ice (see page 169, about the middle of the page). On Uranus, claimed the book, gravity was about 3 times that of Earth. Therefore, if you took a glass of water to Uranus and plunked a few ice cubes in the water the ice would sink to the bottom of the glass (after all, Uranus has more gravity than Earth and therefore can pull more on the ice). Now consider this for a moment. A cubic inch of ice has less mass than a cubic inch of water. Mass determines weight. Since ice, then, has less "weight" than water, ice will float in water. It doesn't matter how much you increase gravity - - ice will *always* float in water! Ice has less mass than water; therefore, it floats. This is not hefty stuff, and it blows my mind that any science fiction writer could have got it wrong.

This means that the city would have frozen from the top of the lake down, instead of freezing from the bottom up (as it did in the book). This also means that had it existed in the real world it might have survived -- had they been deep enough and/or been able to heat the water, the water would not have frozen and their city would not have died.

The aliens of Uranus were a very interesting group. One of their biggest scientific achievements, in my opinion, was their ability to extract precious metals from seawater in what looked like worthwhile quantities. The ability to do this is much sought after, because the ocean contains what may be the biggest deposits of precious metals on the planet. The problem, however, is that the metals are so hard to extract - - the extraction rates are very low, the existing processes are very slow, and it takes many thousands of gallons to extract anything. I'm not sure what the problems are in the extraction, but I would imagine that there are some pretty stiff chemistry problems. Still, someday we will find a way to extract gold from the sea, and when we do we will reap enormous benefits.

One thing that I wonder at, though, is that extracting metals from the sea isn't talked about very much anymore. Years ago it seemed to be a big topic -- the Germans tried it in WWII, the Government experimented with it, and it seemed like it wouldn't be long until we had it. There was even a Rick Brant book (*Sea Gold*) written on the topic. Over the years, however, such a technique seems to have faded into the background. Maybe gold has become cheaper. Maybe other sources were found. I don't know -- but I would like to. What's the holdup here?

Besides the scientific mistakes the book does have some interesting points. First, the ship that the children "hijacked" was extremely interesting. Did you notice that it had enough fuel to go clear to Uranus and return? For one of today's spaceships to make the same trip it would have taken enormous quantities of expensive fuel. In fact, I'm not sure it could be done. The cost, at any rate, would have been astronomical. In the book, though, the fuel the journey ate up wasn't even brought up -- evidently fuel was not an issue here. Somehow, then, they managed to lick the need for fuel -- but how they did this with their atomic engines I'll never know.

Another interesting point is the fact that the ships were navigated completely by computers. All you had to do was put in your destination, press a button, and off you went. Once you got to where you were going you simply loaded in another reel, pressed a button, and you landed. With space travel that easy you wonder why more of space hadn't been explored. After all, if you don't have to worry about the cost, and the controls are on automatic, why not take a few voyages to the outer planets? You never know what you might find...

Is it really possible to make space travel that easy? I would think that, with (maybe great) difficulty, you might be able to create a computerized spaceship that could basically fly itself. That would be the easy part -- it's the fuel that's the big problem. How in the world can you eliminate the fuel problem? Where can you find a nearly unlimited and free source of energy? Even if you found this supply, how could you harness it and turn it into thrust? You see, just having enormous amounts of electricity will get you nowhere. That electricity, somehow, must be turned into thrust, and that is the key problem. Rockets are what we currently use to create thrust, but they carry a big price tag in fuel. If we could do what Tom Swift did -- that is, take normal sunlight, turn that into electrical energy, and use that to power an electrical repulsion beam and thus generate thrust from sunlight -- the galaxy would be ours.

If an answer is ever found to this key problem, the space age will really have begun. Free travel to anywhere in the solar system -- or perhaps the galaxy -- will finally be possible.

Rating: 

2 stars out of 5. This book is, in my opinion, the worst one of the series. Like all the Dig Allen books it wins very high marks for originality, but unfortunately this one falls down in other areas. I find it difficult to believe that the twins could accidentally launch a rocket ship to Uranus -- and both the pirates and the Uranians are too insane to be readily believable. The previous books in the series held together well with a good plot and a sense of plausible excitement that kept the reader on edge; this book lacks both. I will give the book two stars for its excellent imagination, but no more than that.

Appendix A: Who wrote the Dig Allen Series?

Who wrote the Dig Allen series? Well, according to the title pages of the books in the Dig Allen series, Joseph Greene did. Just knowing the name, however, leaves a lot of questions unanswered. Just who was Joseph Greene? Why did he write so few Dig Allen books? Did he write anything else?

For a long time I knew absolutely nothing about Joseph Greene. However, just recently his son found my web page and has sent me several e-mails that cleared up much of the mystery surrounding this man. I have asked him if he would let me post the letter he wrote to me, and since he has agreed here it is.

Dear Jonathan,

My family and I are gratified to know that readers continue to find pleasure in my father's work. He died in 1990. That this modest man's work continues to live beyond his years is comforting and amazing to us.

I was barely a teenager when he wrote the Digby Allen series, but I have many vivid memories of that time. I would come home from grammar school and read the pages created or rewritten that day. Sometimes I would hang around to read them as they came pounding out of his Royal manual typewriter. He always asked my opinion, but I don't know how, or if, he ever used my comments. After sending the drafts to his editor, I would wait for the return mail for the comments or galley proofs. He wrote only six because each required grueling effort and he never wanted his work to become a grind or become a "hack" himself. If my memory serves me correctly, the income generated just wasn't worth the effort.

I have no idea why he chose to write this series or how he chose its subjects or meanings. He also did ghost writing for at least one of the Ellery Queen mystery novels, and I believe for other series also about adolescent boys. Not too long after writing the last of the Dig Allen series, he became an editor for Grosset and Dunlap where he could earn enough to send the first of his three children to college.

He wrote many kinds of works. In the 1930's through the 1950's, he wrote and acted as publisher for many comic books. I believe he also did ghost writing for a number of the most famous comic book characters. In the 1940's he was involved in the creation of the Tom Corbett Space Cadet series for television, novels and comics. There is some controversy as to whether in fact he created series, not Heinlein as is commonly believed. Actually, there are some fans of that series that are researching the issue using files I inherited. (It is clear that he owned the comic book rights and was involved in the project long before Heinlein.) Of his comics, my favorite series are "The Green Lama" and "The Golden Lad". He also wrote for newspapers and magazines. As an editor with Grosset, he was, I believe, most proud of his editing for a book by Judy Collins, her first songbook, a

book about the cartoon, "Krazy Kat", and a book about a Pope and the sculptor who was responsible for casting the Pope's image for a variety of renditions; the title escapes me. One can see his versatility in that he also wrote political articles and biology texts.

I have quite a few of his unpublished manuscripts and ideas for stories, although I don't know if any relate to the Digby Allen series. His files have been sitting in cabinets because we don't know what to do with them and don't have the inclination to make some decisions about them.

You sound like a mature and remarkably literate young man. I wouldn't be surprised if I discovered that my father had people like you in mind when he wrote.

Best wishes,

Paul Greene