Social Education 72(3), pp 124–129

Steam Man and Airships:
Technology of the Future in the Past

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Americans have always dreamed about the future and its possibilities. In the late nineteenth century—called "the Gilded Age" by Mark Twain—the nation's interest in the future was combined with an explosion of technological advancements, such as the electric light bulb and the telephone. This combination created a national optimism regarding the future benefits of technology.[1] The lure of new technology and the possibilities it promised seeped into American popular culture.[2]

In 1882, America's first science fiction series, *The Frank Reade Library*, was published by the Frank Tousey publishing company. *The Frank Reade Library* and the subsequent *Frank Reade Weekly Reader*, were nickel libraries (five-cent stories)—born out of the dime novels of the late nineteenth century and targeted to an adolescent boy audience. In the series, the main character, an independent inventor similar to Thomas Edison, created fantastic inventions that were pivotal to the resolution of the novel's plot. In 17 years and nearly 200 publications, readers traveled with the Reade family around the world and were introduced to imaginative inventions like robots, flying ships, electric wagons, and deep sea submarines.[3] The seeds of "modern" technology had arrived, at least on the pages of the Frank Reade novels.

Frank Reade: America's First Science Fiction

The Frank Reade of the nickel weeklies was not just one character; the tales recounted three generations of Frank Reade family adventures, with Frank Reade, Jr., being the most prolific in the pantheon of the Frank Reade dime chronicles. Of the 184 Reade family adventures penned, all but five starred Frank Reade, Jr,. The family was notorious for the inventions and travel exploits that took them around the globe.

The stories were the brainchild of Frank Tousey, publisher of the Tousey family of magazines. Harold Enton was commissioned to write the initial four stories.[4] The first story, "Frank Reade and His Steam Man of the Plains," starred Frank Reade as an enterprising 16-year-old living in New York. Upon constructing the series' initial steam man, Frank journeyed West with a cousin and his new invention in search of adventure. Three more stories followed in which Frank produced additional steam robots and continued his adventures out West.[5]

After a falling out with Enton over the publisher's insistence that the author remain anonymous, Tousey hired Luis Senarens to pen the remaining Frank Reade adventures.[6] A new author brought a new Frank Reade. The original character was retired, and his son took over the adventures for 179 stories over the next two decades. In contrast to his father, who was pale, slim, and not overly strong, Frank Reade, Jr., was described as a handsome and talented young man, who not only carried on the adventurous and innovative traditions of his father, but would eventually outstrip him in notoriety and variety of inventions created.[7] A third Frank Reade would make his first and only appearance as the protagonist in "Young Frank Reade and his Electric Air Ship; or, a 10,000 Mile Search for a Missing Man," written in 1899. In this story, Frank Reade, Jr., is suddenly old and retired, and his son teams with his sister, Kate Reade, on a search for a family friend.

While revered for their innovations and adventurous exploits, the Reade stories have also been criticized for use of ethnic and racial stereotypes.[8] The writings had an undercurrent of Eurocentric superiority. Native Americans were often identified as savages; Mexicans as greasers; and Jews were sometimes portrayed as greedy. In addition, the Reades were frequently accompanied by two sidekicks, Barney and Pomp, who were subjugated to the negative stereotypes of their ethnic and racial background. The former was an Irishman who was often portrayed as a lover of brawling and boozing, while the latter was an African American who was called such names as "darky" and who spoke with a heavy,

seemingly uneducated accent with comments such as, "P'raps dat am why dey don' come back no mo."[9]

Senarens created a home base for his high-tech adventure that closely resembled Thomas Edison's compound at Menlo Park in New Jersey. "Readestown was a handsome little town, merging into a city, and founded by the senior Reade. Here Frank Reade, Jr., had established his shops and machine works for the special construction of his inventions."[10] Readestown was obviously named for the family of inventors. As it was described in the series, it mimicked Edison's move to, and influence on, Raritan Township—Menlo Park's closest town—in that the town grew as a result of the influence of the resident "invention factory," bringing it fame, and the benefits of inventions. The Menlo Park area was the first to have in-home electricity. In a case of life imitating art, in 1954, Raritan was re-named Edison in honor of its most famous resident (similar to the naming of Readestown).[11]

The Reades were seen as heroic adventurers, but their personal characteristics took a backseat to the new inventions and discoveries highlighted in each new publication. The stories have been described as a kind of prototype of the "boy-inventor" genre of science fiction with descriptions of specialized aircrafts, steam-powered robots, submarines, and electronic automobiles.[12] Later genres and book series, such as the Tom Swift books, would be greatly influenced by these adventures, and their glorification of technological advances can still be seen in the writings of such present-day popular authors as Tom Clancy and Stephen Coonts.[13] In 2005, the anime film *Steamboy* was released in theaters throughout the United States. The film featured a boy-inventor prodigy, not unlike Frank Reade, Jr., who must fight evil and save Victorian London from destruction with the aid of a steam ball containing a new form of energy capable of powering an entire nation.[14]

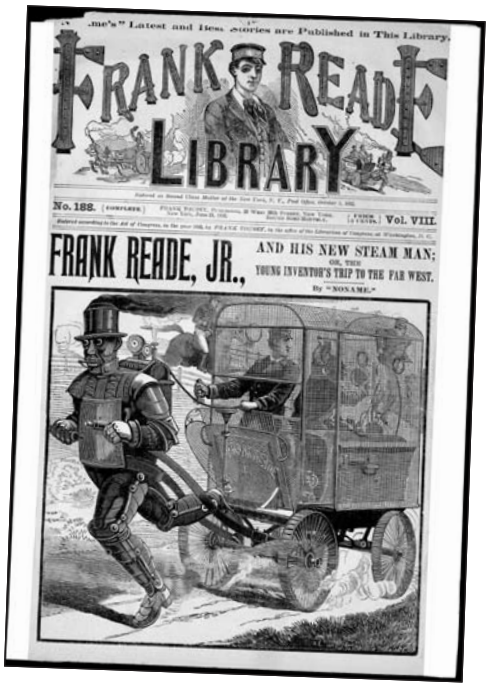
The boy inventor novels were inspired by the real-life experiences of independent inventors like Thomas Edison. The Frank Reade stories resembled the Edison example of an inventor surrounding himself with staff who worked toward creating his new inventions in a factory-like organization. The age of the independent inventor was short lived; independent laboratories gave way to large corporations, such as General Electric and Westinghouse, and their research programs.[15] The popularity of the Frank Reade novels, like the age of the independent inventor, was also brief. Nickel weeklies gave way to pulp fiction (inexpensive fiction magazines)—popular in the first half of the twentieth century—and eventually transformed into popular science fiction novels.[16]

Frank Reade's Inventions

Frank Reade's inventions were fanciful creations rooted in the existing technology of the Gilded Age. In the creation of Reade's fantastical vehicles and gadgets, Senarens utilized steam power and the new field of electricity; he did not create new forms of energy or machines too outlandish for the time. Although the Frank Reade science fiction was clearly set in the recognizable present of the late nineteenth century, it was a present filled with gadgets and vehicles that were of "the future."[17] The following robotic, aeronautic, and submarine examples, which were just a few of the vast array of inventions, attest to the futuristic vision Senarens penned in his writings.

Robotics: The Steam Man of the West

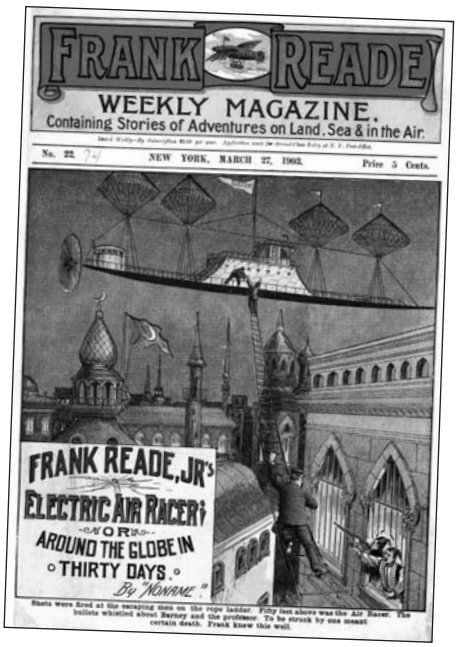
> The man himself was a structure of iron plates joined in sections with rivets, hinges or bars as the needs required. In face and form the machine was a good imitation of a man done in steel. In no wise [*sic*] did he look ponderous or unwieldy, though his stature was fully nine feet. The man stood erect holding the shafts of a wagon at his hips. The wagon itself was light but room with four wheels and a top covering of fine steel network. This was impervious to a bullet while anyone inside could see quite well all about them. ... Steam was the motive power. The hollow legs and arms of the man made the reservoirs or boilers. In the broad chest was the furnace. Fully two hundred pounds of coal could here be placed, keeping up a fire sufficient to generate steam for a long time. The steam chest was upon the man's back, and here were a number of valves. The tall hat worn by the man formed the smoke stack. The driving rods, in sections, extended down the man's legs, and could be set in motion so skillfully that a tremendous stride was attained, and a speed far beyond belief. This was the new steam man.[18]



Today, the newest robotic invention is Zeno, a human companion that can engage in conversation, express emotion, and within the next three years may be available to consumers at a price of less than $300.[19] More than 100 years ago, the dime novel penned by Senarens made a similar invention with his steam man. While his imagination far exceeded the reality of his day, as the humanoid robot would not become a reality until the 1930s, the Frank Reade dime novels were not the first to imag-

ine such a creation. Man has long held a fascination with robots. As far back as the fifteenth century, Leonardo Da Vinci had designed a humanoid robot on paper. Yet it would not be until the 1939 New York World's Fair, that Westinghouse Electric Corporation would unveil the first known humanoid robot to a mass audience. Named Elektro, the robot measured seven feet in height and could walk and move its head and arms by voice command.[20] The initial humanoid robot that could perform tasks without continuous human guidance, similar to the steam man, would not be developed until 1948.[21] While steam was the method Frank Reade used to power his robot, the robots of today are powered by powerful microchips that have the capability of storing huge quantities of data and sequences of movement. [22]

Aeronautics: The Needle and Others



The air-ship was fully one hundred and twenty feet in length. Her hull was cylindrical, and, except in the center was round and slender. The material was platinum and hardened steel, in thinly rolled plates. The bow of the Needle was a long, pointed ram.

Above the hull rose four hollow rotascope shafts, to a height of forty feet. Upon the top of these were the revolving rotascopes themselves, driven at fearful speed by electric engines. At the rear of the air-ship were two blade-like plates, between which was suspended the shaft of the propeller. This was made of thin steel. The main body of the air-ship consisted of a cabin, one-fourth of the length of the hull. There were circular windows in this, with plate glass, and around the deck ran a hand rail. At the forward end of the deck was the pilot house. Upon the roof of this was a powerful electric searchlight. This is a meager description of the exterior of the air-ship.[23]

The dime novel hero's air-ships looked strikingly similar to maritime vessels, with rear propellers, pilot houses, and variations on the sail. However, Frank Reade's ships sailed across continents, through the air—something that would not be accomplished for another 30 years. At the turn of the twentieth century, fascination with flight was not restricted to the pages of dime novels. Air travel was being readily pursued and the most reliable aircrafts of the time were engine powered air-ships, which were not yet able to travel long distances. These aircrafts resembled balloons or blimps and were steered and propelled through the air, but unlike the Frank Reade air-ship, which was able to remain aloft by moving an airfoil through the air to produce lift, the air-ships of that time relied on gasses that were lighter than air to create its buoyant lift. Outside the pages of Frank Reade's dime novel, the necessary advancements in aerodynamics, propulsion, and flight control would not be commonplace for many decades.[24]

Submarines: Exploring the World Below the Surface

The Explorer, which was the name given the submarine boat, was a long, cylindrical craft, with a sheer-pointed bow carrying a huge steel ram on the end, shaped like a knife.

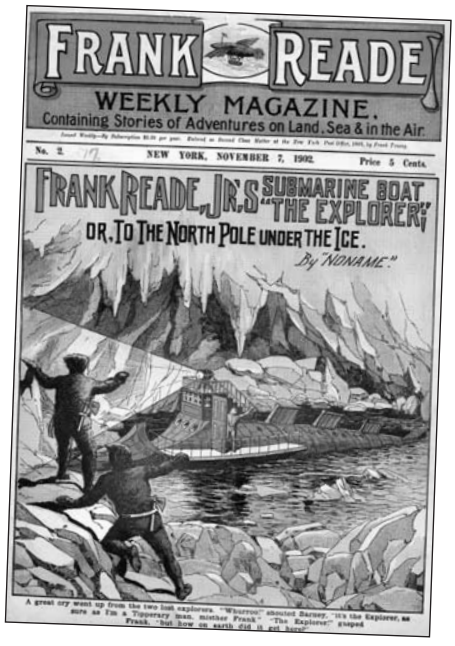
"The hull is of solid steel," said Frank. "But, though strong and tough, not too heavy." The submarine vessel tapered off in the stern to the shape of a fish, while upon the shelving deck or whale-like back were fins or plates of steel.

"The fins keep the boat steady under water," said Frank.

A platform, with a railing extending along each side of the craft, with a gang ladder leading to the hurricane deck and pilot-house which was upon the vessel's bow. Here a search light was placed. …

"Here are the dynamos rooms," he said. "All the electrical machinery is here.

Just aft there are large chambers which we fill with water when we wish to sink, and when we wish to rise the water is expelled in a few seconds by the act of compressed air."[25]



The submarine of Frank Reade was yet another example of a concept—while not foreign to the culture of the time—that employed accessories and ideas well ahead of its time. While submarines were a part of the late nineteenth and early twentieth century lexicon, the first modern submarines were not introduced until the 1920s.[26] The sub-

marines of Frank Reade could remain submerged for long periods of time and travel thousands of miles underwater. The reality of that period was much different. The most advanced subs at the turn of the twentieth century had a surface range of approximately 100 miles and just over 10 miles underwater. It would be another half century, when nuclear power partially replaced diesel-electric propulsion and equipment was developed to extract oxygen from seawater, before submarines would have the endurance to make the long underwater journeys that the dime novel adventurer had accomplished with his invention. [27]

Frank Reade in the Social Studies Classroom

While dime novels' popularity waned around 1910, their value as an academic tool are still relevant as social history.[28] Racial and ethnic stereotypes, time period comparisons, political opinions, and the development of the myth of the American West are examples of topics of classroom inquiry that can be addressed through the evaluation of dime novels. These periodicals also can lead to a discussion with students on the prevailing themes of a particular time period and can be used to contrast how textbooks portray similar topics.

The following are some activities that focus on NCSS thematic strands and may be implemented in the classroom utilizing dime novels:

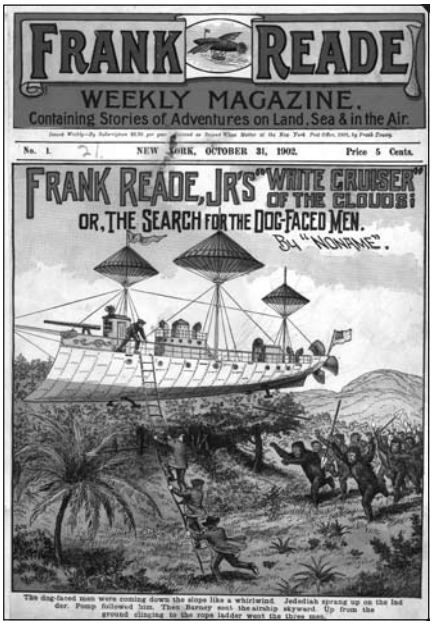
NCSS THEMATIC STRAND: ❶ CULTURE

A Window into the Mindset of the Turn of the Twentieth Century American: Stereotypes of the "Other"

"Consequently they were the most surprised when suddenly from the depths of the forest there came a series of wild shouts, and half naked blacks were seen bounding toward them."

"Frank raised his rifle and discharged it in the air. The effect was magical. Every negro went out of sight in an instant."

"In battle they were fierce and invincible. Of all the savages in Central Africa they were the most bloodthirsty." [29]



The previous excerpts came from *Frank Reade, Jr.'s "White Cruiser" of the Clouds, or, The Search for the Dog-faced Men*. Not unlike other literature of its era, the Frank Reade dime novels included many offensive stereotypes. As students read, they should identify these labels in preparation for a teacher-led discussion on stereotypes. Teachers may want to use resources, such as those offered by Teaching Tolerance (tolerance.org), to explore the prejudices and stereotypes within this story. One lesson offered by Teaching Tolerance, "Checking on Stereotypes" (in the March 2008 section of *The ABCs of Culture in the Classroom)*, which can be adapted for older grades, leads students to identify stereotypes they have experienced or heard, to discuss how such stereotypes can be erroneous, and to identify specific ways to break down stereotypes. The March/April 2008 issue of *Social Studies and the Young Learner*, though focused on younger students, offers excellent universally-applicable tips for addressing stereotypes in "Beyond Wildlife: Teaching about Africa and Stereotypes," by Barbara B. Brown and Alicia Carroll.

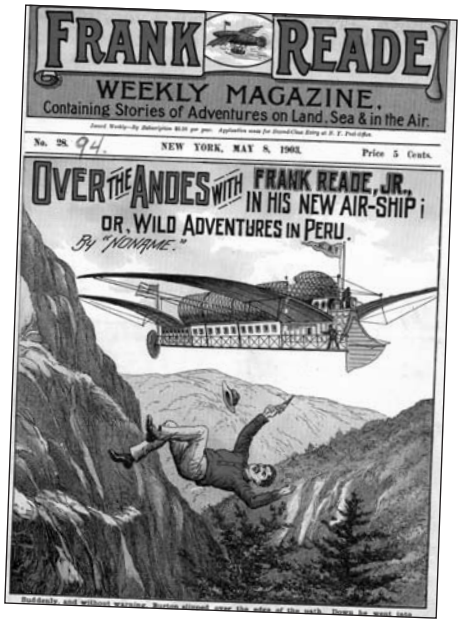
NCSS THEMATIC STRAND: ❽ SCIENCE, TECHNOLOGY, AND SOCIETY

The Technological Divide: From Steel to Frank Reade Dime Novels to the World Today

Historically, when it comes to technology, there have always been the haves and have-nots. This activity explores the ways those with access to technological innovations have been able to dominate and achieve a more comfortable lifestyle over those lacking the same access. Students will begin the activity by reading a Frank Reade, Jr., article, noting ways Frank Reade's technological innovations allowed him to gain advantages over the different groups he came across. Upon completing a discussion of the dime novel, students can be assigned separate time periods and technological innovations, individually or in groups, to research how the assigned innovation led to social change and allowed one group to gain power over another. For example, students could explore PBS's Guns, Germs, and Steel website, **www.pbs.org/gunsgermssteel/variables/steel.html**, to investigate the influence steel had in allowing one group to dominate over another. In addition, the PBS **Frontline/World site www.pbs.org/frontlineworld/stories/india/links.html#02** could be utilized to explore links on the digital divide and its impact.

Technology: An Evolutionary Facilitator of Mankind?

> Not content yet the famous young inventor who had acquired immense wealth with which to ensure success had embarked upon a new project the like of which the world had never before heard of.
>
> "This time" he declared "I intend to build an air-ship which will be able to carry a dozen or more persons around the world if need be. It shall excel all previous efforts!"
>
> As the report went out to this effect, the whole country became agog with interest.[30]



The above selection is from *Over the Andes with Frank Reade, Jr., in His New Air-Ship; Or, Wild Adventures in Peru*.[31] As the snippet attests, Frank Reade, Jr., would build an air-ship with the potential of traveling to parts unknown. In this activity, students should read the air-ship adventure as an attention-getter. After reading the dime novel, the teacher could lead a class discussion or break the students into small groups to answer the following questions:

How might this innovation, or other Frank Reade innovations such as the steam man, improve life during the late nineteenth century?

How might such innovations be detrimental to life during that time?

How might it change the values and beliefs of Americans?

Upon completing the discussion, students will research how their assumptions compare with reality, by investigating how the invention and development of air travel improved life and altered the values and beliefs of Americans. A couple of sites that could be used for research are the NASAexplores site, **www.nasaexplores.com/show2_articlea.php?id=04-055**, and the Smithsonian National Air and Space Museum site, **www.nasm.si.edu/.**

Conclusion

The Frank Reade dime novels are more than an interesting artifact of the American Gilded Age. These stories are the beginnings of the modern science fiction novel in the United States. They illustrate the hope that Americans of the time held for the future that newly invented technology could offer. Although the Frank Reade stories highlighted the promise of technology, they also provide a window into Gilded Age society. This time period was not only a period of great promise and prosperity, it was also a time of economic hardship, a strict social class system, and prejudice. The Frank Reade stories can be effectively used in the social studies class as a segue into a discussion of the impact of technology, as well as an analysis of the social system of the late nineteenth century.

Notes

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6. Cox, *Dashing Diamond Dick and Other Classic Dime Novels* (New York: Penguin Books, 2007).
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8. Cox, *Dashing Diamond Dick and Other Classic Dime Novels*.
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10. Senarens, *Frank Reade, Jr.'s Submarine Boat "The Explorer", or, To the North Pole Under the Ice* (New York: Frank Tousey Publishing, 1902), 1.
11. David C. Sheehan, "Eventful Past Makes for Bustling Present." Accessed September 21, 2007. Available from www.edisonnj.org/history.eventful.asp.
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23. Luis Senarens, *Frank Reade, Jr.'s Air Racer; Or, Around the Globe in Thirty Days* (New York: Frank Tousey Publishing, 1903), 5. A number of the Frank Reade stories appear to have striking similarities with Jules Verne's novels; this story can be paralleled with *Around the World in Eighty Days.* There are other Frank Reade stories that bare similarities to *20,000 Leagues Under the Sea*, and *Journey to the Center of the Earth.*
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30. Senarens, *Over the Andes with Frank Reade, Jr., in His New Air-Ship; or, Wild Adventures in Peru* (New York: Frank Tousey Publishing, 1894), 1.
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The authors would like to thank Dr. Mark Greenberg, director; Paul Eugene Camp, librarian; and Dr. Keli E. Rylance, assistant librarian, from the University of South Florida Special Collections Department, **www.lib.usf.edu/public/index.cfm?Pg=SpecialCollections**, for all their help and support.

Related Websites

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InventNow—US Patent Office and National Inventors Hall of Fame Foundation, Inc.
www.inventnow.org/

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edition.cnn.com/SPECIALS/2004/explorers/

Time Magazine's Best Inventions of 2007
www.time.com/time/specials/2007/article/0,28804,1677329_ 1678542,00.html

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www.time.com/time/2006/techguide/bestinventions/

Rube Goldberg
www.rube-goldberg.com/

Rube Goldberg Machine Contest
www.anl.gov/Careers/Education/rube/rubeteams.html

X Prize Foundation
www.xprize.org/

Lemelson-MIT InvenTeams
web.mit.edu/inventeams/index.html

Pulps and Comic Books: Popularizing Air and Space Travel
www.centennialofflight.gov/essay/Social/pulps/SH12.htm

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library.stanford.edu/depts/dp/pennies/home.html

WayBack: U.S. History for Kids
pbskids.org/wayback/future/index.html