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How Science Fiction Becomes Science Fact: Coincidence or Self-Fulfilling Prophecy?

Many of the modern technologies that people enjoy today, such as cell phones, tablets, and submarines, were first envisioned by the minds of science fiction authors many generations ago. As seen in Jules Verne's works of science fiction, such as *Twenty Thousand Leagues Under the Sea*, the author's imaginary creations, particularly the *Nautilus*, have proven over time to provide the blueprint for the scientific reality of future generations. Even technologies featured in television shows, for example, *Star Trek*, exhibit this same phenomenon: they begin as imaginary creations, but result in real technology. Due to the way in which Verne demonstrated the uses of his technologies, presented his ideas throughout his novels, and exploited the communication methods of his time, the technologies that he proposed became reality. Yet many of these technologies were in their early stages of existence long before the writings of these authors; most of whom, like Verne, did not predict technology, but inspired it.

There are many who credit Verne with dreaming up the concept of the submarine: an underwater vessel capable of both marine research and naval warfare. However, Verne did not invent the submarine, but publicized it. William Bourne originally proposed the concept of a submersible, underwater vessel in 1580; however, Cornelius Drebbel built the first working model in 1603. In 1800, an American inventor named Robert Fulton "submitted to the French admiralty plans for a submarine, *Nautilus*, intended to slither beneath the hulls of British warships and leave a powder charge to be exploded later" (Phillips). The French government

rejected his idea of a submarine, as did the American and British governments. In 1852, an American named Lodner Phillips also built a submarine and offered to sell it to the US Navy, to which they responded, "No authority is known to this Bureau to purchase a submarine boat . . . the boats used by the Navy go on [and] not under the water" (qtd. in Harris, “Submarine History”). During the American Civil War, which lasted from 1861 to 1865, he again offered to sell his submarine to the navy. Again they refused. After wasting money on the submarine *Alligator* in 1861, which proved to be a disaster, the navy viewed submarines as an unworthy investment; in a time of war and limited resources, they could not afford to risk their funds on unproven technology. Nevertheless, the Confederate government gladly allowed individual entrepreneurs to risk their own money, and permitted citizens to privateer submarines for use against the Union fleet; these privately owned and operated vessels included the *Hunley*, which became famous for sinking the USS Housatonic. In 1870 Verne “brought submarines to full public consciousness” (Harris, “World Submarine History”) with *Twenty Thousand Leagues Under The Sea*; prior to his novel, it was primarily the scientific community and some government officials who were aware of submarine technology. Yet in 1887, only fourteen years after the debut of the novel’s English translation (Novels), the U.S. Navy “announced an open competition for a submarine torpedo boat, with a $2 million incentive”; in 1893, they advertised another competition after “the U. S. Congress appropriated $200,000 for an ‘experimental submarine’ ” (Harris, “World Submarine History”). Not only was the US Navy interested in a submarine, but they were also willing to pay large amounts of money for one; before Verne’s book, they had soundly rejected the idea without a second thought. This demonstrates that governments throughout the world only became interested in the use of submarines for warfare after Verne brought submarine technology to the attention of the public.

Although Verne modeled his fictional apparatus, the *Nautilus*, after actual submarines which existed during his lifetime, these early crafts were very different from those in existence today. While early submarines comprised of propellers driven by hand-cranked pumps and could fit only a few people, modern submarines, powered by nuclear fission, can hold over 135 passengers. They can also dive to over eight hundred feet deep and remain submerged for up to three months, while older submarines were unstable, sank easily, and could travel a few miles at best. Due to the disparity between modern submarines and older models, it is remarkable that Verne correctly described many features of modern submarines over one hundred years before their invention. For example, the *Nautilus* had "two hulls, fitted one inside the other in a cellular arrangement, so that . . . the vessel could sink by filling its reservoirs". The submarine could also ascend when electricity drove "pumps which expelled the water and allowed the vessel to rise again" (Verne, *Twenty Thousand Leagues* 59-60). In modern times, submarines "feature inner and outer hulls. Between the two hulls is a space [which] hold[s] air and/or seawater . . . When a sub is ready to dive underwater, vents on top of the ballast tanks release air and let in heavier seawater . . . [and] it starts to sink" (Price). However, the similarity between the designs did not emerge because Verne predicted the future, but because his depiction of submarines inspired their development based on how people imagined them to appear. Many people, after they encounter futuristic technology in a fictional work, dream of those technologies existing in *their* world; due to this, science fiction "has a long history of becoming science fact, as outlandish creations inspire real research" (Science Fact). Science fiction works can evoke inventions and movements in science and technology through the introduction of ideas to society.

In his writings, Verne not only depicts the designs of future technologies, but also describes their uses to the world. For example, he displays his *Nautilus* as a weapon with which

to wage war, a vessel used to bring peace, and a means by which to conduct research about the previously unexplored depths of the ocean; all of which are modern-day uses for submarines. Even though the main character, M. Aronnax, is technically a prisoner on board the *Nautilus* and has no "wish to trammel the liberty of [his] companions in any way . . . [he also feels] no desire to leave" (Verne, *Twenty Thousand Leagues* 156), for his newfound opportunity to explore the ocean is worth his imprisonment. As M. Aronnax expresses to the readers, he has no wish to leave "[his] ocean, '[his] Atlantic', as [he] liked to call it, thus, without having observed its lowest strata, or learnt from it those secrets that the Indian seas and the Pacific had taught [him]!" (Verne, *Twenty Thousand Leagues* 172). "Thanks to [Captain Nemo] and his apparatus, [he] was each day completing [his] submarine studies, and . . . writing [his] book on submarine depths again in the very midst of its element" (Verne, *Twenty Thousand Leagues* 156). As Captain Nemo expresses to M. Aronnax, "You have carried your investigations as far as terrestrial science [has] allowed you. But on board my vessel you will have an opportunity of seeing what no man has seen before. Thanks to me, our planet will give up her last secrets" (Verne, *Twenty Thousand Leagues* 52-53). It is in this sentence that the aim of the novel becomes evident: not only to showcase futuristic technologies, but to display them in a way that the readers can fully comprehend their value to the world, if they were to exist. Verne, through his writings, "lead[s] the way into the hithero inaccessible corners of the globe and advertise[s] the wonders to be found there . . . [and allows his readers] to witness all the marvels of an undersea world that was virtually unknown to [his] contemporary readers" (Stableford 2,330-2,331). In modern times, submarines have contributed immensely to the exploration of the oceans, and to the wealth of knowledge, though far from complete, that we now possess regarding the seas.

In another of his novels, *The Mysterious Island*, Verne's characters discuss the issue of a dwindling coal supply, and what will replace this power source in the future. Through an exchange between an engineer, Cyrus Smith, and a reporter, Gideon Spilett, Verne describes the technology known in modern times as hydrogen power, which hydrogen fuel cells utilize to produce energy. In these cells, hydrogen and oxygen are combined to form pure water, releasing heat and electricity in the process. When asked "what will people burn in place of coal?", the engineer replies that "Water is the coal of the future". In this scene, Smith describes how "water broken down into its component elements . . . by electricity . . . will one day be used as fuel . . . [and] the hydrogen and oxygen of which it is constituted will be used, simultaneously or in isolation, to furnish an inexhaustible source of heat and light, more powerful than coal can ever be" (Verne, *Mysterious Island* 379). Verne does not only describe the use of hydrogen power, though. He also provides many examples of future implications of this technology, such as "to run the steamships and locomotives . . . [and to] warm our homes and ourselves with water" (Verne, *Mysterious Island* 379). To describe technology and how it works is an important part of any science fiction work, but Verne persuaded society of the necessity of that technology in the future when he illustrated its usefulness to the world; in essence, Verne advertised a concept to humanity through his writings and advocated for its invention in the future, with the knowledge that such an appealing technology begged to be brought to life.

Moreover, Verne's presentation of ideas is the most important aspect of his writings in regard to the absorption of technological ideas by the audience. A scientific paper which proposed a new type of technology would have been considered insipid by the average person, and the scientific institutions of the time would likely have denied them access to such a paper anyways. However, vivid adventure stories such as those written by Verne enthrall their readers,

transporting them into a realm of excitement and exploration. *Star Trek*, which inspired many modern technologies, had the same effect. Each episode begins with exciting music and a dramatic narration of the words, "Space-- the final frontier. These are the voyages of the Starship *Enterprise*. Its five-year mission-- to explore strange new worlds, to seek out new life and new civilizations, to boldly go where no man has gone before" (Roddenberry 00:01:59-00:02:23). This introduction declares to audiences that the show will immerse them in an intriguing story from worlds far beyond their own; worlds filled with extraterrestrial life, unfamiliar planets, and unexplored and potentially dangerous corners of the universe. The challenge of science fiction is to simultaneously educate and entertain the audience. If the audience becomes bored, any hope of influencing them disappears. As stated in *The Tipping Point*, "There is a simple way to package information that, under the right circumstances, can make it irresistible. All you have to do is find it" (Gladwell, 132). In science fiction, the irresistible way to package information is to present it in the course of an adventure; this is why Verne's works were so successful in impacting technological developments.

Furthermore, these kinds of books were available to common people, which allowed them to explode into popularity and made them ideal carriers for the same type of information as a scientific paper. As Patrick Purdy, a user experience design professional, states: "Once science fiction has been put out there, the ideas can begin to be absorbed into the technological climate. The degree and speed at which they can be absorbed depends . . . on the [work's] . . . success in the marketplace, and on the idea's accessibility as a storytelling component" (Purdy). Therefore, a work's popularity, the way in which it spreads, and the amount of people that it reaches are more important than its content in determining the absorption of its ideas by its audience. Likewise, Malcolm Gladwell asserts that "Ideas and products and messages and behaviors spread

just like viruses do" (Gladwell). Thus, a large part of what allows science fiction to be inspirational is grounded in its advertisement, popularity, language of publication, and other factors which impact the audience reached by the work.

In addition, industrialization and new technologies also led to the explosion of science fiction. With mass communication systems and information availability, such as mass distributed newspapers, the telegraph, telephones, and more recently the internet, it has become possible for people to preview, buy, sell, critique, and recommend books from anywhere, at any time; the exchange of ideas has become nearly instantaneous. As James Burke affirms, "in the nineteenth century, after the development of electromagnetic systems for moving messages around . . . the whole body of modern science emerges" (Burke). Additionally, the ability to mass produce books, and to ship them around the world, has contributed greatly to the spread of ideas. Companies such as Amazon, which distribute books worldwide, significantly contribute to this. During Verne's time, the invention of railroads and steamships made the transport of his books possible. Later, transportation methods extended to encompass planes and automobiles; nowadays, television, iTunes, streaming, Youtube, modern shipping, and the internet make it possible to circulate books, TV shows, and films worldwide as well. Science fiction, in these forms, can be distributed globally, and can therefore influence a much larger audience; consequently, a larger audience increases the likelihood that the work will reach scientists and compel them to perform actual research. Although people tend to think of scientists, engineers, and inventors as isolated geniuses, "the spread and combination of new ideas is what [really] drives behavior change and innovation" in society (Pentland). Without sources of inspiration, innovation would be impossible; therefore, the ideas and developments of a time period are,

more accurately, the product of that period's media. Similarly, the technology of one generation is a product of the science fiction works of the previous one.

Though Verne is a wonderful example of a science fiction author who inspired the future, the phenomenon is not unique to him, nor is it limited to books. For example, characters in the original *Star Trek* series, which first aired on September eighth of 1966 (Star Trek), use devices which resemble early flip phones, tablets, and more; since then, scientists and engineers have developed many of these technologies. In fact, the inventor of the cell phone, Martin Cooper, even remarked that his "vision for a personal wireless handheld telephone was inspired by watching Captain Kirk using his communicator on . . . Star Trek" (Blazeski). Even tractor beams and teleportation, as portrayed in *Star Trek* and other science fiction works, may become a reality in the future. According to *Business Insider*, a team of Chinese scientists, in July of 2017, teleported photons from earth to a satellite in orbit over 311 miles away (Marquart). Even more recently, a group of engineers used a technology known as a sonic tractor beam to levitate and control a styrofoam ball with high pressure vortices of sound waves (Allen). In these instances, history demonstrates how technologies of all sorts have their origin in science fiction. Science fiction has given us many technologies in the past, and will continue to do so in the future; by influencing our imaginations and pushing us to create technology beyond the limits of what we thought possible, science fiction continually demonstrates that only our imagination and determination limit the future's possibilities.

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