

Asymptote[®] REVIEW **AR**

2009, Vol. 1

An Entertaining Excursion into Intellectual Property

No. 1

Multiple Inventors Often Thrive After Work of Single Discoverer

Introducing Leo, Nikola & Glenn

By **W. Thad Adams, III**

There is a difference between discovering something and inventing something. The “discovered” thing always existed, but needed a person to understand it and explain it to others, be it principles of flight or relativity.

Everyone has heard of Albert Einstein. He was a discoverer of several fundamental principles of nuclear physics — principles we typically lump under the broad term “theory of relativity.” His name is a widely-used synonym for a genius, particularly of the egghead variety.

But how many have heard of Leo Szilárd? He was both a discoverer and an inventor. He is generally credited with conceiving the idea of nuclear chain reaction, an idea Einstein said would never work.

Szilárd went further, filing numerous patent applications applying his discoveries to practical application. In a real sense, Szilárd is far more responsible for how we use Einstein’s discoveries today than Einstein.

Plus, there is another interesting dimension

to Szilárd that is even less well known than his discoveries and inventions — his clear-eyed realization during World War II of the Axis Powers’ plans for the development of nuclear weapons and his determination to prevent it.

Szilárd’s name recognition even in the 1940’s was nowhere near powerful enough to gain the attention of the United States government to the danger, so he persuaded Einstein, who by then had become a pacifist, to enlist his name in the effort to prevent the Axis powers from building nuclear weapons.

Szilárd’s fascinating story begins below.



Similarly, who has not heard of *Orville and Wilbur Wright*? They are properly credited with the discovery and early application of the principles of controlled flight that finally permitted man to leave the ground and travel in powered machines through the air. Their determined efforts despite many failures have inspired inventors for the past century. The Wright brothers were active in filing and obtaining patents, but others developed the aircraft in the directions that ultimately transformed our lives by allowing us to travel long distances quickly and safely.

How many remember *Glenn Curtiss*?

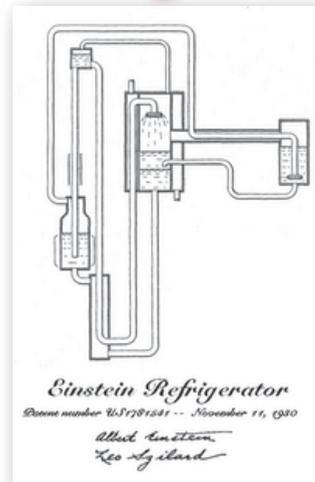
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Einstein establishes relativity, Szilárd proves theory’s relevance

By **W. Thad Adams, III**

Leo Szilárd was born into a Jewish family from Budapest at the time of the Austro Hungarian monarchy before World War I. He studied engineering at Budapest Technical University in 1916 but was drafted into the Austro Hungarian Army in 1917. In 1919 he resumed engineering studies at Budapest Technical University but soon decided to leave Hungary because of the rising antisemitism under the Horthy regime.

Szilárd continued engineering studies at Technische Hochschule in Berlin Charlottenburg, but soon switched his studies to physics and took classes from Einstein, Planck, and Max von Laue. His dissertation on thermodynamics *Über die thermodynamischen Schwingungserscheinungen* (On The Manifestation of Thermodynamic Fluctuations) in 1922 was praised by Einstein and awarded the highest honor. In 1923 he received the doctorate in physics from the Humboldt University of Berlin and was appointed to a position as assistant



Leo Szilárd was more of a pragmatist who collaborated with his mentor, Albert Einstein, on the first patented refrigerator with no moving parts.

to von Laue at the University of Berlin’s Institute for Theoretical Physics in 1924. Unlike Einstein, Szilárd was always seeking practical applications for his ideas, and while an instructor in Physics at University of Berlin he worked on numerous technical inventions, for example, a 1928 German patent application on the linear accelerator and a 1929 German patent application on the cyclotron.

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Szilárd Establishes Relevance for Relativity

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He formed a collaboration with Einstein and was awarded a patent on a refrigerator without moving parts — U.S. Patent 1,781,541.

In 1933 Szilárd fled to London to escape Nazi persecution, where he read an article written by Ernest Rutherford in *The Times* which rejected the possibility of using atomic energy for practical purposes. This annoyed Szilárd to no end, and like many inventors, took the Rutherford's rejection as a challenge. While walking to work at St Bartholomew's Hospital he conceived of the idea of the nuclear chain reaction while waiting for traffic lights to change on Southampton Row in Bloomsbury, and the following year he filed for a patent on the concept — G.B. Patent 630,726.

In 1936, he assigned the "chain reaction" patent to the British Admiralty to ensure its secrecy in view of what he viewed, correctly, as the coming war. Later, Szilárd was the co-holder, with Nobel Laureate Enrico Fermi, of the patent on the nuclear reactor — U.S. Patent 2,708,656.

When Szilárd moved to Columbia University in 1938, he teamed up with Enrico Fermi. After learning about nuclear fission in 1939, they concluded that uranium would be the element capable of sustaining a chain reaction. Szilárd and Fermi conducted a simple experiment at Columbia and discovered significant neutron multiplication in uranium, proving that the chain reaction was possible and opening the way to nuclear weapons.

Szilárd had been inspired to be the first scientist to seriously examine the science behind the creation of nuclear weapons in 1932, after reading about fictional "atomic bombs" described in H. G. Wells' science fiction novel *The World Set Free*. As a scientist, Szilárd was the first person to conceive of a device that, using a nuclear chain reaction as fuel, could be used as a bomb.

The Germans and others were in a race to produce a nuclear chain reaction. German scientists tried to control the chain reaction using graphite, but these attempts proved unsuccessful. Szilárd realized graphite was indeed perfect for controlling chain reactions, just as the Germans had determined, but that the method of producing graphite used boron carbide rods, and the minute amount of boron impurities in the manufactured graphite was enough to stop the chain reaction. Szilárd had graphite manufacturers produce boron free graphite. As a result, the first human controlled chain reaction occurred on Dec. 2, 1942.

Szilárd was directly responsible for the creation of the Manhattan Project. While Einstein sat on the sidelines as a pacifist, Szilárd drafted a confidential letter to Franklin D. Roosevelt explaining the possibility of nuclear weapons, warning of German work on such weapons and encouraging the development of a program to create such weapons as a means of countering what he viewed as the inevitable, eventual success by Germany. In August 1939 he approached his old friend and collaborator Albert Ein-



We turned the switch, saw the flashes, watched for 10 minutes, then switched everything off and went home. That night, I knew the world was headed for sorrow.

Leo Szilárd

Reflecting on the first nuclear chain reaction

stein and convinced him to sign the letter, having realized that only Einstein's reputation was great enough to provide the necessary credibility to get the concerns raised in the letter through the bureaucracy to President Roosevelt.

The Einstein-Szilárd letter led directly to the establishment of research into nuclear fission by the U.S. government and ultimately to the creation of the Manhattan Project.

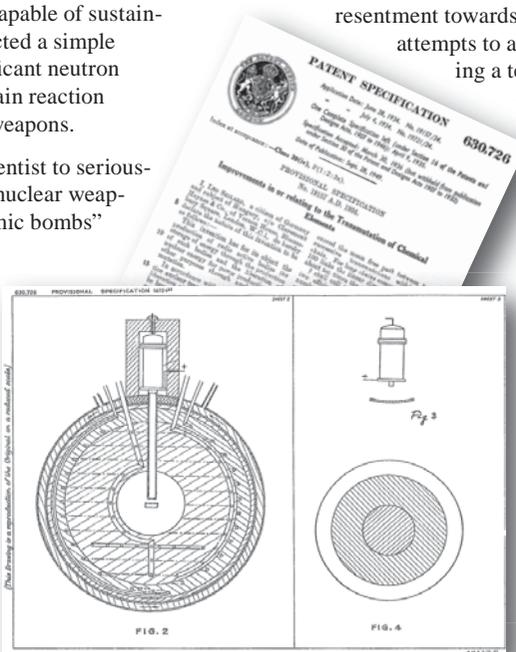
As the war continued, Szilárd became increasingly dismayed that scientists were losing control over their research to the military, and clashed many times with General Leslie Groves, military head of the project. His resentment towards the U.S. government was exacerbated by his failed attempts to avoid the use of the atomic bomb in war through having a test organized that could be witnessed by Japanese

observers who would then have the opportunity to surrender and spare lives. He hoped that the U.S. government would not use nuclear weapons because of their potential for use against civilian populations. Szilárd hoped that the mere threat of such weapons would force Germany and/or Japan to surrender. He drafted the Szilárd petition advocating demonstration of the atomic bomb. However with the European war concluded and the U.S. taking heavy casualties in the Pacific, the new U.S. President Harry Truman sided with advisors and chose to use atomic bombs against Hiroshima and Nagasaki over the protestations of Szilárd and other scientists.

In 1947, Szilárd switched fields of study because of his horror of atomic weapons, moving from physics to molecular biology

In 1960, Szilárd was diagnosed with bladder cancer. He underwent radiation therapy using a treatment regimen that he designed himself. A second round of treatment followed in 1962; Szilárd's cancer remained in remission thereafter. He spent his last years as a fellow at the Salk Institute in San Diego.

In May 1964, Szilárd died in his sleep of a heart attack at the age of sixty six. At his memorial it was said that Death was required to come to him while asleep, or otherwise he would have outwitted it. Szilárd was clearly a genius who applied his intelligence in many practical ways. His effect on today's world, for good or ill, is arguably greater than Einstein's. Yet today he is largely unknown outside the ranks of fellow physicists. Einstein, on the other hand, seems destined to be remembered for all time.



Leo Szilárd's patent application for nuclear fission included drawings that helped convey the process visually.

Thomas Edison rival Nikola Tesla (Father of Physics) 'Sheds Light over Face of the Earth' with Oscillator

Often described as the most important scientist and inventor of the modern age, Nikola Tesla was not only a genius, a mechanical engineer and an electrical engineer, he was also a full-blown eccentric who was and remains largely unknown outside of the scientific community.

Best known for many revolutionary contributions in the field of electricity and magnetism in the late 19th and early 20th centuries. Tesla's patents and theoretical work formed the basis of modern alternating current (AC) electric power systems. This includes the polyphase power distribution systems and the AC motor, with which he helped usher in the Second Industrial Revolution.

Contemporary biographers of Tesla have regarded him as The man who "shed light over the face of Earth" and "The Father of Physics". Other popular monikers include: "The man who invented the twentieth century" and "the patron saint of modern electricity."

After his demonstration of wireless communication (radio) in 1894 and after being the victor in the "War of Currents", he was widely respected as one of the greatest electrical engineers who worked in America. Much of his early work pioneered modern electrical engineering and many of his discoveries were of groundbreaking importance. During this period, in the United States, Tesla's fame rivaled that of any other inventor or scientist in

history or popular culture, but due to his eccentric personality and his seemingly unbelievable and sometimes bizarre claims about possible scientific and technological developments, Tesla was ultimately ostracized and regarded as a mad scientist. Tesla died in January 1943, broken in spirit and impoverished.

The unit measuring magnetic flux density or magnetic induction, the tesla, is named in his honor as well as the Tesla effect of wireless energy transfer to wirelessly power electronic devices which Tesla demonstrated on a low scale as early as 1893.

Aside from his work on electromagnetism and electromechanical engineering, Tesla contributed to the establishment of robotics, remote

control, radar and computer science, and to the expansion of ballistics, nuclear physics, and theoretical physics. In 1943, the Supreme Court of the United States credited him as being the inventor of the radio.

When Tesla came to the United States, he was hired by Thomas Edison. He claimed he was offered US\$50,000 (~ US\$1.1 million adjusted for inflation) if he could redesign Edison's inefficient motors and generators. Tesla worked night and day on the project and gave the Edison Company several profitable new patents in the process. In 1885 when Tesla inquired about the payment for his work, Edison replied, "Tesla, you don't understand our American humor." Tesla was never paid. Earning a mere US\$18 per week, Tesla would have had to work for 53 years to earn the amount he was promised. The offer was equal to the initial capital of the company. Tesla resigned when he was refused a raise to US\$25 per week.

Tesla eventually found himself digging ditches for a short period of time — coincidentally for the Edison company. Tesla even used this time to focus on his AC polyphase system, which Edison (believing DC electricity was the future) had never wanted to hear about.

In 1886, Tesla formed his own company, Tesla Electric Light & Manufacturing. The initial financial investors disagreed with Tesla on his plan for an alternating current motor and eventually relieved him of his duties at the company. Tesla worked in New York as a common laborer from 1886 to 1887 to feed himself and raise capital for his next project. In 1887, he constructed the initial brushless alternating current induction motor, which he demonstrated to the American Institute of Electrical Engineers in 1888.

Tesla demonstrated "the transmission of electrical energy without wires" that depends upon electrical conductivity as early as 1891. The Tes-

la effect (named in honor of Tesla) is the archaic term for an application of this type of electrical conduction (that is, the movement of energy through space and matter; not just the production of voltage across a conductor).

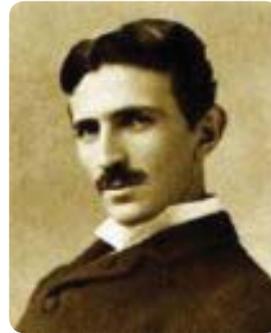
In the late 1880s, Tesla and Edison became adversaries in part due to Edison's promotion of direct current (DC) for electric power distribution over the more efficient alternating current advocated by Tesla and Westinghouse. Until Tesla invented the induction motor, AC's advantages for long distance high voltage transmission were counterbalanced by the inability to operate motors on AC. As a result of the "War of Currents," Edison and Westinghouse went nearly bankrupt, so in 1897, Tesla released Westinghouse from contract, providing Westinghouse a break from Tesla's patent royalties. Also in 1897, Tesla researched radiation which led to setting up the basic formulation of cosmic rays.

When Tesla was 41 years old, he filed the first basic radio patent (U.S. patent 645,576). A year later, he demonstrated a radio controlled boat to the US military, believing that the military would want things such as radio controlled torpedoes.

Tesla, in August 1917, first established principles regarding frequency and power level for the first primitive radar units. In 1934, Émile Girardeau, working with the first French radar systems, stated he was building said systems "conceived according to the principles stated by Tesla". By the 1920s, Tesla was reportedly negotiating with the United Kingdom government about a ray system.

On Tesla's seventy fifth birthday in 1931, *Time* magazine put him on its cover. The cover caption noted his contribution to electrical power generation. Tesla received his last patent in 1928 for an apparatus for aerial transportation which was the first instance of VTOL (vertical take-off and landing) aircraft.

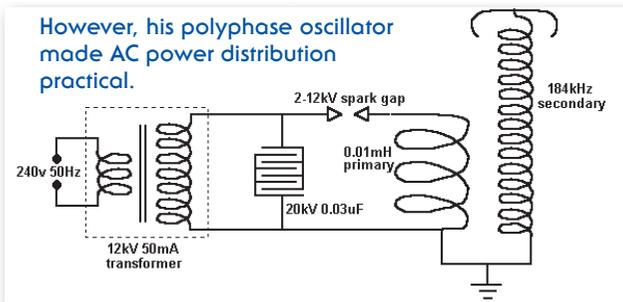
Tesla worked on plans for a directed energy weapon from the early 1900s until his death. In 1937, Tesla composed a treatise entitled "The Art of Projecting Concentrated Non-Dispersive Energy through the Natural Media" concerning charged particle beams. Tesla published the document in an attempt to explain a "superweapon that would put an end to all war". This treatise of the particle beam is currently in the Nikola Tesla



Nikola Tesla, 1856-1943

Tesla did not invent AC power.

However, his polyphase oscillator made AC power distribution practical.



Continued on 'Nikola Tesla' on page 4

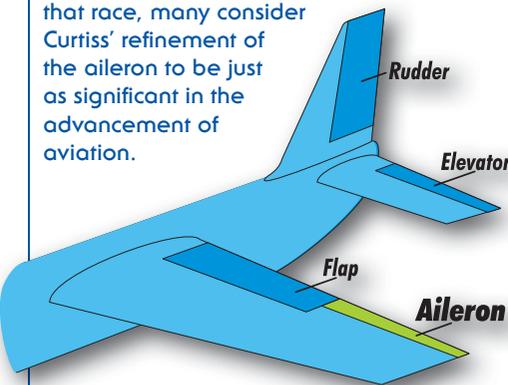
Curtiss refines lateral control, loses in court

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also stated in their application that a feature like ailerons could provide lateral control.

Obtaining a patent meant that no one could copy the Wrights' design without their permission and without paying them a royalty. However, the success of the Wrights' design, intensified by Octave Chanute's well meaning publicizing of their achievements, was too tempting for other aircraft designers to ignore. Furthermore,

Glenn Curtiss was among many notable adventurers racing to be the first in flight. Though the Wright Brothers won that race, many consider Curtiss' refinement of the aileron to be just as significant in the advancement of aviation.



the concept of lateral control was so basic to any aircraft design that, without it, no aircraft could have flown successfully.

Curtiss was the main target of the Wrights' patent suits in the U.S. Curtiss was one of the original members of the Aerial Experiment Association (AEA), which the inventor Alexander Graham Bell had established on September 30, 1907. The group consisted of a group of aviation enthusiasts Bell had drawn together to build a practical airplane using the \$20,000 that his wife Mabel contributed toward the effort.

When the AEA dissolved, Curtiss moved into more businesslike ventures. He teamed with Augustus Herring, former associate of Octave Chanute, and formed the Herring Chanute Company. The company built the Gold Flier, sometimes known as the Golden Bug, which, in an attempt to avoid the ailerons the Wrights had described in their patent, introduced ailerons that were mounted between the two biplane wings. Curtiss first flew the biplane on June 16, 1909, at Morris Park in the Bronx in New York. Ten days later, he flew his first circle in front of 5,000 paying viewers. Then he moved to Mineola on Long Island, and on July 17, won the Scientific American trophy for the second time, flying 25 miles (40 kilometers).

The Wrights had seen enough. They filed

a patent infringement lawsuit against Curtiss and the Herring Curtiss Company charging that Curtiss and the company had used the Wrights' lateral control and aileron design without permission. The Aeronautic Society, which had purchased Curtiss' Golden Flier and was flying it frequently at exhibitions, agreed to pay the Wrights a percentage of gate receipts from their exhibitions. Curtiss chose to contest the suit.

The battles that followed drained the financial resources of both parties with legal and court fees. Lawyers attempted to bring Curtiss and the Wrights together for an amicable settlement, but had no success. When Wilbur died of typhoid fever in 1912, the Wright family blamed Curtiss' stubborn refusal to back down, claiming that Wilbur had lost his health over concern for the patent litigation.

The final verdict came in 1913. Orville Wright, now without Wilbur, was the unmistakable winner. All delays and appeals had been exhausted. The Court of Appeals ordered Curtiss to cease making airplanes with two ailerons that operated simultaneously in opposite directions.

Unexpected help for Curtiss came from the automobile magnate Henry Ford. Ford had won a similarly difficult action with patents relating to the automobile, coincidentally heard by the same judge. Ford's loss of the case would have virtually destroyed his business. Ford advised Curtiss to use Ford's lawyer. Curtiss took his advice.

The lawyer encouraged Curtiss to bait Orville to reopen the litigation by devising a new configuration for lateral control using the Langley aerodrome that hung in the Smithsonian. The idea was to persuade the court that Curtiss' plane was based on Langley's design, not on the Wrights'. The attempt was unsuccessful, but the case dragged on. Ford's lawyer was able to persuade the court to temporarily stay the old verdict, and the legal battles started again.

The suit finally ended with the advent of World War I when the aircraft manufacturers established the Manufacturers' Aircraft Association to coordinate wartime aircraft manufacturing in the United States and formed a patent pool with the approval of the U.S. government. All patent litigation ceased automatically. Royalties were reduced to one percent and free exchange of inventions and ideas took place among all the airframe builders.

In 1917, the U.S. government subsequently proffered a large and profitable contract to Curtiss to build aircraft for the U.S. Army. The Wright Aeronautical Corporation, a successor to the original Wright Company, ultimately merged with the Curtiss Aeroplane and Motor Company in July 1929, forming the Curtiss Wright company, just before Glenn Curtiss' death in 1930. This company still exists today.

Nikola Tesla: Patron Saint of Modern Electricity

Continued from page 3

Museum archive in Belgrade. It described an open ended vacuum tube with a gas jet seal that allowed particles to exit, a method of charging particles to millions of volts, and a method of creating and directing nondispersive particle streams (through electrostatic repulsion).

His records indicate that it was based on a narrow stream of atomic clusters of liquid mercury or tungsten accelerated via high voltage (by means akin to his magnifying transformer). Tesla gave the following description concerning the particle gun's operation:

[The nozzle would] send concentrated beams of particles through the free air, of such tremendous energy that they will bring down a fleet of 10,000 enemy airplanes at a distance of 200 miles from a defending nation's border and will cause armies to drop dead in their tracks.

Tesla remained bitter in the aftermath of his incident with Edison. The day after Edison died the New York Times contained extensive coverage of Edison's life, with the only negative opinion coming from Tesla, who was quoted as saying:

"He had no hobby, cared for no sort of amusement of any kind and lived in utter disregard of the most elementary rules of hygiene ... His method was inefficient in the extreme, for an immense ground had to be covered to get anything at all unless blind chance intervened and, at first, I was almost a sorry witness of his doings, knowing that just a little theory and calculation would have saved him 90 percent of the labor. But he had a veritable contempt for book learning and mathematical knowledge, trusting himself entirely to his inventor's instinct and practical American sense."

Shortly before he died, Edison said that his biggest mistake had been in trying to develop direct current, rather than the vastly superior alternating current system that Tesla had put within his grasp.

In 1926, Tesla commented on the ills of the social subservience of women and the struggle of women toward gender equality, indicated that humanity's future would be run by "Queen Bees". He believed that women would become the dominant sex in the future.

While Wrights Garner First Flight, Curtiss' Aileron Refinements Equally Important in Advancing Aviation

Born in Hammondsport, New York, in 1878, Glenn Curtiss showed an early interest in mechanics and inventions. His first job was at the Eastman Dry Plate and Film Company (later Eastman Kodak Company) where he invented an early stencil machine and rudimentary camera to study photography.

Curtiss' interest in aviation came by way of motorcycles. In 1902 he began manufacturing motorcycles with his own single cylinder engines, including one that used a tomato can for a carburetor. In 1903 he set a motorcycle land speed record at 64 miles per hour (103 km/h) for one mile (1.6 km). In 1907 he set a world record of 136.36 miles per hour, and for four years, until 1911, he was literally "The Fastest Man on Earth".

In 1904, Curtiss became a supplier of engines for California "aeronaut" Tom Baldwin. In that same year, Baldwin's California Arrow, powered by a Curtiss 9 HP V-twin motorcycle engine, became the first successful dirigible in America. In 1907, Curtiss was approached by Alexander Graham Bell to provide a suitable engine for heavier than air flight experimentation. Bell was impressed by Curtiss and his engine, the result being an invitation to join Bell's Aerial Experiment Association (AEA). Through the course of the next two years, the AEA produced four aircraft, each one an improvement over the last.

Curtiss primarily designed and flew their third aircraft, the famous June Bug, 5,080 feet on July 4th, 1908, to win the Scientific American Trophy. This was considered to be the first pre-announced public flight of a heavier than air flying machine in America. For this flight and for other achievements that were to follow, Curtiss received U.S. Pilot's license #1 from the Aero Club of America. The flight of the June Bug propelled Glenn Curtiss and aviation firmly into public awareness.

In August 1909, Curtiss competed in the world's first air meet, the Grande Semaine d'Aviation flying contest at Rheims, France, organized by the Aero Club de France. The Wrights, who were selling their machines to customers in Germany at the time, elected to not personally compete. There were two Wright aircraft at the meet but they did not win any events. Curtiss

went on to win the overall speed event, flying a 10 km course at 46.5 miles per hour in just under 16 minutes, 90 mph slower than on his motorcycle 4 years earlier!

On 14 November 1910, Curtiss demonstration pilot Eugene Ely took off from a temporary platform mounted on the forward deck of the cruiser USS Birmingham. His successful takeoff and ensuing flight to shore marked the beginning of a relationship between Curtiss and the Navy that remained significant for decades. Through the course of that winter, Curtiss was able to develop a float (pontoon) design that would enable him to take off and land on water. Demonstrations of this advancement were of great interest to the Navy, but more significant as far as the Navy was concerned, was Eugene Ely successfully landing his Curtiss pusher (the same aircraft used to take off from the Birmingham) on a makeshift platform mounted on the rear deck of the battleship USS Pennsylvania. This was the first arrester cable landing on a ship and the precursor of modern day carrier operations.

The Wright brothers were granted a patent by the U.S. Patent Office in 1906 for a flying machine. This patent was based on the application they had submitted in 1903 that had included a detailed description and drawings of their control system as applied to a glider. Their application described wing warping, as well as the entire system that allowed the aircraft to be controlled in forward flight. The Wrights had

See 'Curtiss' on page 4



Working with Alexander Graham Bell's Aerial Experiment Association (AEA), Glenn Curtiss helped develop four aircraft – each one an improvement over the previous – and was the recipient of U.S. Pilot's license No. 1.

Single Discovery Can Fuel Many Inventors

Continued from front page

Curtiss was an early inventor whose work dramatically improved aircraft efficiency. He was often in conflict with the Wrights, but ultimately is credited with the invention of the aileron. His story begins on page 3.

As with Einstein and Szilárd, the Wrights and Curtiss illustrate a point that can be made in virtually every field of endeavor; someone always achieves fame beyond his or her contemporaries, whether fully deserved or not.

Finally, does the name *Nikola Tesla* ring a bell? Unknown to most, Tesla is credited with a range of inventions rivaling those of Thomas Edison, though Tesla's name has been largely

forgotten in all but narrow scientific circles.

Tesla worked with Edison as well as Westinghouse before going out on his own, compiling a truly breathtaking list of inventions, some of the most notable including:

- Alternating current (AC) long-distance electrical transmission systems, and other methods and devices for power transmission — typically in direct competition with Edison's direct current (DC) developments;
- Wireless communication, including prior art for the invention of radio and radio frequency oscillators;
- Robotics, the logic gate, corona discharge ozone generator, and methods for providing extremely low level of resistance to the

passage of electrical current (predecessor to superconductivity); and

- Vertical take-off and landing (VTOL) aircraft.

Tesla's lack of name recognition is at least partly attributable to his own lack of civility and the perception of him as being a "crank."

The stories of Tesla, Curtiss and Szilárd featured in this issue of *Asymptote Review* are three examples we've chosen to illustrate the point that for every discoverer there may be many inventors who follow the discovery with practical and often better inventions for applications of the discovery.

I hope you enjoy this issue of *Asymptote Review*. As always, we welcome your comments and criticism.

Who We Are

The firm specializes solely in patent, trademark and copyright law, and the related areas of unfair competition and trade secret law. Our lawyers have expertise in a broad range of intellectual property issues.

Our practice within this specialty is diverse, including prosecution of patent and trademark applications in the United States Patent and Trademark Office; domestic and international patent, trademark and copyright prosecution and licensing. The firm also has extensive litigation experience and regularly litigates patent, trademark, copyright and related trade secret and unfair competition matters in Federal and State Courts and before government agencies.

The firm is United States patent counsel for foreign corporations, many of whom have facilities in the Charlotte area. We assist both foreign and domestic companies and individuals in planning and executing overall patent and trademark strategy.

The firm's clients are involved in diverse areas of science and business, including filtration equipment, medical equipment, orthopedic products, child safety products, power transmission equipment, turbine engines, electronic controls, audio and video duplication equipment, aircraft passenger seats, and valves.

The firm also represents advertising and public relations agencies, golf courses, computer programming specialists, stock car racing teams, and national restaurant chains.

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INVENTORS, INVENTIONS & OTHER I.P. TRIVIA

1. **Josephine Cochran** invented the first marketable electric dishwasher in the 1950's. In the process, the company she founded eventually became known by what name?
 - Maytag
 - KitchenAid
 - Amana
 - Viking
2. **The Q-tip** was invented by Leo Gerstenzang in the 1920s. What did the "Q" stand for?
 - Quick
 - Quiet
 - Quality
 - Nothing
3. **Carl Magee** holds the patent for a "coin-controlled parking meter" issued in 1938. Where was the first parking meter installed?
 - Manchester, England
 - New York
 - Brugges, Holland
 - Oklahoma City
4. **American inventor Thomas Edison** died in October 1931. How did a grateful nation mourn his passing a few days after his death?
 - President Hoover laid a wreath at Edison's Menlo Park laboratory in Raritan township
 - Electric lights across the U.S. were dimmed for one minute
 - Raritan township voted overnight to change the city's name to Edison, N.J.
 - Congress passed a bill offering commemorative light bulbs to every U.S. citizen
5. **Canadian-born** physical education instructor **James Naismith** invented the game of basketball in 1891. When was basketball first played at the Olympics?
 - 1908
 - 1936
 - 1948
 - 1956
6. **The first practical ballpoint pen** was invented in 1935 by the Biro brothers, Lazlo and Georg. Lazlo was a chemist, but what was Georg's profession?
 - Newspaper editor
 - Poet
 - Lawyer
 - Doctor
7. **The disposable diaper** was invented by American Marion Donovan in 1950. Apart from being an inventor and a mother, what other profession did Donovan practice?
 - Interior design
 - Architecture
 - Tennis instructor
 - Chef
8. **Isaac Singer** is best known as the flamboyant inventor of the sewing machine. Prior to developing a practical sewing machine in the 1850s, what profession did Singer practice?
 - Tailor
 - Blacksmith
 - Actor
 - Lawyer

Answers can be found at www.adamspat.com

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