



Heartland Science

Ohio's Legacy of Discovery & Innovation



Communications

From Greenbacks to Lexis-Nexis

The Buck Stops Started Here

Salmon P. Chase, a Cincinnati lawyer who became Abraham Lincoln's Secretary of the Treasury, in 1864 invented the nation's modern currency, including coins with the words "In God We Trust" and green paper money.



The motto was placed on United States coins as a reaction to increased religious sentiment during the Civil War. At the time, Chase was Secretary of the United States Treasury. He frequently received requests from devout U.S. citizens encouraging that God be recognized on currency. Treasury Department records show that the first such letter arrived November 13, 1861 penned by a Rev. M. R. Watkinson, Minister of the Gospel from Ridleyville, PA. Read the resulting correspondence at www.treas.gov/education/fact-sheets/currency/in-god-we-trust.html.

Did You Know?

- The United States Government began printing money in 1862, when "greenback" currency was issued to finance the Civil War.
- In 1964, when silver coins became too expensive to make, Battelle Memorial Institute in Columbus designed the nickel-copper "sandwich" metal now used for coins.
- The United States Mint is responsible for producing coins and the Bureau of Engraving and Printing (BEP) produces currency notes.
- The BEP produces approximately 37 million currency notes each day with a face value of about \$696 million -- 45% of these notes are the \$1 denomination.
- About 95 percent of the currency notes printed each year are used to replace notes that are already in circulation.



Find out more...

- [The United States Mint \(www.usmint.gov\)](http://www.usmint.gov)
- [Manufacturing Process of U.S. Coins \(www.treas.gov/education/fact-sheets/currency/manufacturing.html\)](http://www.treas.gov/education/fact-sheets/currency/manufacturing.html)



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Ohio's Legacy of Discovery & Innovation



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Chemical Abstracts Service

Chemical Abstracts Service (CAS), founded in Columbus in 1907, provides pathways to published research in the world's journal and patent literature -- virtually everything relevant to chemistry plus a wealth of information in the life sciences and a wide range of other scientific disciplines back to the beginning of the 20th century.



CAS, a division of the American Chemical Society, is the world's leader in providing scientists online and web access to chemistry-related research data. CAS produces the world's largest and most comprehensive databases of chemical information and makes them available through sophisticated search and analysis software for the use of scientists engaged in new product and patent research, as well as academic research in the world's leading universities. CAS databases include more than 23 million abstracts of chemistry-related literature and patents and more than 26 million organic and inorganic substances and over 56 million sequences. For the latest count visit <http://info.cas.org/cgi-bin/regreport.pl>.



CAS was founded in 1907 with the aim of monitoring, abstracting, and indexing the world's chemistry-related literature. This aim was first accomplished through the well known printed reference work CHEMICAL ABSTRACTS (CA), which CAS continues to publish after more than 90 years. CAS began to develop computer-based publication technologies in the 1960s in order to automate the publication of CA. Today, CAS editorial processes apply the best advantages of document analysis by highly trained scientists and the benefits of advanced information technology.

CAS indexes and abstracts patents, articles from approximately 9,000 scientific journals, conference proceedings, and other documents pertinent to chemistry, life sciences and many other fields. In 2004 alone, CAS scientists provided

- abstracts and indexing for over 865,000 journal articles, patents, and other research materials
- CAS Registry Numbers and substance records for more than 17 million substances.

Through the printed CA, CA on CD™, the STN Internationalsm online network, the CAS files distributed through licensed vendors, the SciFinder® and SciFinder Scholar™ desktop research tools, and the STN Easy® or STN on the Web servicessm, data produced by CAS is accessible to virtually any scientific researcher worldwide in industry, governmental research institutions, and academia.

Substance identification is a special strength of CAS, which is widely known for the CAS Chemical Registry, the largest substance identification system in existence. When a chemical substance is newly encountered in the literature processed by CAS, its molecular structure diagram, systematic chemical name, molecular formula, and other identifying information are added to the Registry and assigned a unique CAS Registry Number®.

CAS Registry Numbers are used in reference works, databases, and regulatory compliance documents by many organizations around the world to identify substances without the ambiguity of chemical nomenclature.



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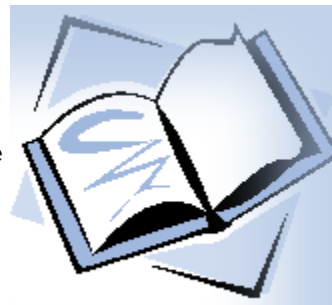


Communications

From Greenbacks to Lexis-Nexis

Funk and Wagnall's Dictionary

Adam Wagnalls, born in 1843 in Lithopolis, was co-founder of the Funk and Wagnalls Publishing Company publisher of the famous Funk & Wagnalls Dictionary, and other standard handbooks including the Literary Digest.



Impact on Lithopolis

Adam Wagnalls and his wife, Hester Anna Willis Wagnalls, were both born and lived in Lithopolis, a village just south of Columbus, OH. Adam moved away at the age of five, but the family's impact on the village is impressive. They had a daughter, Mabel, and the family maintained ties to the area by frequent visits to family and friends. One of Hester's dreams was to "do something for the little village which had never had anything done for it." Mabel would make this dream come true -- though after her mother's death in 1914 -- by establishing the Wagnalls Memorial Library. Mabel also established The Wagnalls Foundation in 1925.



Art work is displayed throughout the Memorial complex. Prized pieces include original Norman Rockwell paintings which served as covers for The Literary Digest, an early Funk and Wagnalls publication. Four of the Norman Rockwell covers may be viewed online at www.wagnalls.org:

- Friends and Allies (Oil on canvas) April 19, 1919
- Grandpa's Christmas Visit (Oil on canvas) December 24, 1921
- The Rewards of Patience (Oil on canvas) July 30, 1921
- The Boutonniere (Oil on canvas) April 15, 1922

The works of many other prominent illustrators who worked for the Funk and Wagnalls publishing company are also on display, including J. F. Kernan, F. X. Leyendecker, and John Ward Dunsmore who served not only as a friend but as the official portrait artist to the Wagnalls.

Find out more...

- [Wagnalls Memorial Library](http://www.wagnalls.lib.oh.us) (www.wagnalls.lib.oh.us)
- [The Wagnalls Foundation](http://wagnalls.org/) (<http://wagnalls.org/>)



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From Greenbacks to Lexis-Nexis

Improved LCD Displays

Two Ohioans have had a great impact on the liquid crystal display (LCD) market. James Ferguson of Kent State University, in 1969 discovered the twisted nematic field effect of liquid crystals, which led to a better LCD, used in pocket calculators, digital wristwatches, and computer displays. And, John L. Janning, of Dayton, discovered a way to permanently align molecules in liquid crystal materials. It opened the way to large-scale manufacture of liquid crystal displays in the early 70's. Janning's 250 other inventions include "Stay-Lit" Christmas lights. The technology of LCDs were first integrated into watches and calculators, but have now impacted many industries from medical to industrial equipment, and consumer electronics, toys, and accessories.



Ferguson's Impact

In 1970, James Ferguson made the first operating LCDs. Previously, LCDs required a lot of power and worked for only a limited time. They also had poor contrast, making them a bit hard to read. Ferguson joined the Liquid Crystal Institute at Kent State University during the 60s. While serving as Associate Director there, Ferguson discovered the twisted nematic field effect of liquid crystals. He then left the University and founded his own company, International Liquid Crystal Company (ILIXCO), in Kent, OH. Ferguson then focused on developing an improved display, based on the twisted nematic field effect. The result was a longer lasting, easier to read device, which became the industry standard. Ferguson did not make a patent application at the time, however, and two men (Wolfgang Helfrich and Martin Schadt) who worked at F. Hoffmann La Roche in Basel, Switzerland, published a paper on the same effect in 1971. Later, Hoffmann La Roche purchased Ferguson's patent rights.



About Janning

John L. Janning of Dayton, Ohio, has over 50 U.S. Patents and 250+ worldwide. He began his career at NCR, and then launched his own business - JLJ, Incorporated - to focus full time on his research and inventions. Janning developed the liquid crystal molecular alignment invention which improved the display and made large scale manufacturing a profitable venture. In addition to his work on LCDs, Janning also invented the thermal printing wafer, which is used in thermal fax machines, and the familiar orange plasma displays seen in many checkout counters. Another invention is the Stay Lit® Christmas light set, which incorporates a microchip into each socket that regulates the voltage across each socket. This technology keeps a string of lights bright even if there are broken, loose, or burned out bulbs.

What is an LCD?

LCD stands for Liquid Crystal Display -- a special type of display that is used on portable computers, digital watches, and other products. LCDs incorporate two sheets of special polarized materials with a liquid crystal solution sandwiched between. When an electric current is passed through the liquid, it causes the crystals to align themselves so that light cannot pass through. Each crystal behaves like a miniature shutter, able to either block or allow light to pass through.



Find out more...

- [Ferguson Patents](http://www.fergasonpatents.com/)
(<http://www.fergasonpatents.com/>)
- [International Liquid Crystal Company History](http://www.ilixco.com/background.html)
(<http://www.ilixco.com/background.html>)
- [Marquis Who's Who Publications: Janning](http://www.marquiswhoswho.net/STAYLIT1225/)
(<http://www.marquiswhoswho.net/STAYLIT1225/>)
- [How LCDs Work](http://www.howstuffworks.com/lcd.htm)
(<http://www.howstuffworks.com/lcd.htm>)



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Ohio's Legacy of Discovery & Innovation



Communications

From Greenbacks to Lexis-Nexis

Lexis-Nexis

The Lexis® service, the first commercial, full-text legal information service, began in 1973 in Dayton to help legal practitioners research the law more efficiently. The companion Nexis® news and business information service launched in 1979 to enrich research with recent and archival news and financial information. Since that time, the service has grown to become the largest news and business online information service, including comprehensive company, country, financial, demographic, market research and industry reports. Providing access to thousands of worldwide newspapers, magazines, trade journals, industry newsletters, tax and accounting information, financial data, public records, legislative records, data on companies and their executives makes the LexisNexis® service an indispensable tool for gathering information and providing accurate answers.



About LexisNexis

LexisNexis has compiled a long history of delivering on its mission -- to enable its customers to spend less time searching for critical information and more time using LexisNexis knowledge management tools to guide critical decisions. Legal professionals have trusted the publishing brands in the LexisNexis Group for more than a century.

For the past three decades, the company's markets have grown to include business people and other professionals in governments, corporations, academic institutions and other enterprises, all with access to this world of critical information via easy-to-use electronic products. Now, LexisNexis Group delivers comprehensive and authoritative legal, business, government and tax information worldwide as an industry leader. It unites proprietary brands, advanced Web technologies, and premium information sources for customers in the legal, corporate, government and academic markets in 100 countries on six continents.



Origins

In 1994, Reed Elsevier acquired the LexisNexis™ service. Begun in Dayton as a contractor to the U.S. Air Force in 1966, its electronic data-search system became the first to retrieve full-text documents. In 1973, the company introduced a legal-research system that revolutionized the way in which legal research and analysis was conducted. The technology

propelled the legal profession into a new era. In 1979, a companion news and business-information service was introduced under the Nexis banner. Michie™, founded in the late 1800s and the sole provider of statutes for 35 U.S. states and territories, joined the fold of LexisNexis in 1987.

With the advent of the World Wide Web, LexisNexis moved its information products and services to the new distribution channel, eliminating the need for proprietary software or extensive training. In September 1997, LexisNexis debuted the first Web-based service for U.S. legal professionals, the precursor to LexisNexis™ at www.lexis.com.

Key Facts

- 4.6 billion searchable documents
- 2 billion public records
- More than 16,000 databases
- More than 32,000 legal, business and news sources
- Customers include 97 percent of Fortune 500 companies and the top 100 U.S. law firms as identified by The American Lawyer
- 7.2 million full-time equivalent students (more than 70 percent) have access to LexisNexis Academic at 1,650 U.S. colleges and universities
- 3.2 million in U.S. and Canada

Find out more...

- [LexisNexis®](http://www.lexis-nexis.com/)
(<http://www.lexis-nexis.com/>)
- [LexisNexis Interactive History Timeline](http://www.lexis-nexis.com/anniversary/timeline.asp)
(<http://www.lexis-nexis.com/anniversary/timeline.asp>)



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Ohio's Legacy of Discovery & Innovation



Communications

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America's Librarian

Dr. John Shaw Billings, a graduate of Miami University and the Medical College of Ohio in Cincinnati in 1860, became one of the world's most famous librarians. He started the famed National Library of Medicine, published the first Index Medicus, and directed the New York Public Library, where he pioneered many modern library innovations. He also convinced industrialist Andrew Carnegie to spend \$60 million to build nearly 3,000 free public libraries nationwide.



History of the National Library of Medicine (NLM)

NLM historical collections trace their beginnings to 1818. In that year Dr. Joseph Lovell, the first Surgeon General of the Army, filled a few of his office shelves with books, journals, and pamphlets to serve as a reference collection for the Army surgeons under his command. In 1836 the growing collection was officially named the Library of the Office of the Surgeon General, United States Army. After the Civil War, the Surgeon General's Library received an infusion of medical books and journals from the Army's temporary hospitals, which closed at the end of hostilities. To take charge of the burgeoning collection, the Army summoned 27-year-old career Army medical officer and book lover Dr. John Shaw Billings (1838-1913), who set out to create a comprehensive collection of medical materials. The relentless Dr. Billings wrote letters to physicians, editors, health and government officials, librarians, and society officers requesting donations, exchanges, and outright purchases. He accosted State Department officials traveling overseas, entreating them to bring back foreign medical books and journals.



Billings was so dedicated to his quest to build a world-class library that Oliver Wendell Holmes noted, "Dr. Billings is a bibliophile of such eminence that I regard him as a positive danger to the owner of a library, if he is ever let loose in it." Billings' voracious reading in the Library made him one of the most learned men of Gilded Age America. He was a top authority in such fields as public health administration, hospital design, vital statistics, scientific medicine, hygiene and ventilation technology, census organization, epidemiology, and science administration. Under his stewardship, the Library's roughly 2,300 medical volumes grew into a collection of some 124,000 bound volumes. By 1895 the Surgeon General's Library was the largest medical library in the Americas and possibly in the world.

Find out more...

- [National Library of Medicine \(www.nlm.nih.gov\)](http://www.nlm.nih.gov)
- [John Shaw Billings: An Autobiographical Fragment, 1965 \(www.nlm.nih.gov/hmd/pdf/johnautobio.pdf\)](http://www.nlm.nih.gov/hmd/pdf/johnautobio.pdf)
- [John Shaw Billings Centennial, 1965 \(www.nlm.nih.gov/hmd/pdf/john.pdf\)](http://www.nlm.nih.gov/hmd/pdf/john.pdf)



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Communications

From Greenbacks to Lexis-Nexis

Home Mail Delivery

Joseph W. Briggs instituted the first free home mail delivery in Cleveland in 1863, and the Federal Government called him to Washington to institute the system nationwide. He also designed the first mail carriers uniform. Briggs said he thought of home delivery during the winter of 1862-1863 while watching how women had to wait in line in freezing weather for letters from loved ones fighting in the Civil War.



Though not required to do so, Briggs encouraged other postal employees to deliver mail to the citizens of Cleveland for free. Home delivery was such a hit with residents that the idea swiftly expanded to other cities. In 1863, 49 northern offices participated, which employed some 450 letter carriers. Letter carriers were encouraged to wear distinctive blue-grey uniforms beginning in 1968.

Until 1887, the Post Office Department determined that cities eligible for free delivery had to have a population in excess of 20,000. After 1887, threshold dropped to cities with 10,000 residents, or with postal revenues in excess of \$10,000. By the end of the 1800's, 13,696 letter carriers were delivering city mail. Today, over 250,000 men and women deliver mail to cities across the U.S.



Did You Know?

- American households were required to have mailboxes beginning in 1916, when the Post Office Department made them mandatory.
- Before every house had its own mailbox, postmen were instructed to "ring twice" to alert residents to the arrival of the mail.
- The first uniforms for letter carriers were blue-grey, to distinguish them from the dark blue worn at the time by the police and firefighters.

Find out more...

- [National Postal Museum - History of Home Delivery](http://www.postalmuseum.si.edu/exhibits/2b1b_carriersmail.html)
(www.postalmuseum.si.edu/exhibits/2b1b_carriersmail.html)
- [National Postal Museum - Short silent film depicting letter carriers in 1903 leaving a post office for the day's delivery](http://www.postalmuseum.si.edu/exhibits/2b1b1_5_briggs_movie.html)
(www.postalmuseum.si.edu/exhibits/2b1b1_5_briggs_movie.html)
- [Photo of Joseph Briggs](http://www.postalmuseum.si.edu/exhibits/2b1b1_1_briggs.html)
(www.postalmuseum.si.edu/exhibits/2b1b1_1_briggs.html)
- [U.S. Domestic Postage Rates: 1845 - Present](http://www.postalmuseum.si.edu/museum/1e1_letter.html)
(www.postalmuseum.si.edu/museum/1e1_letter.html)



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Ohio's Legacy of Discovery & Innovation



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From Greenbacks to Lexis-Nexis

McGuffey Reader

William H. McGuffey developed his famous McGuffey Reader series while teaching at Miami University in Oxford, Ohio from 1826-1836. McGuffey Readers became the standard text for teaching students to read in elementary schools throughout the United States. More than 125 million copies have been sold, and they are still available for purchase today.



McGuffey's Readers and Speller were the books from which children learned to read and write in the 1800s and 1900s. The McGuffey Primer taught children to memorize the alphabet in order, and then to accurately pronounce words.

Stories included in the McGuffey Reader included adventures, poems, and fables, and each usually integrated a moral lesson. Sample titles of stories include:

- "The Greedy Girl"
- "The Kind Little Girl"
- "The Honest Boy and the Thief"
- "The Effects of Rashness"
- "On Speaking the Truth"
- "Consequences of Bad Spelling"
- "Decisive Integrity"

Popular authors were also included, such as Defoe, Irving, and Byron. The books were also known for their intricate illustrations.





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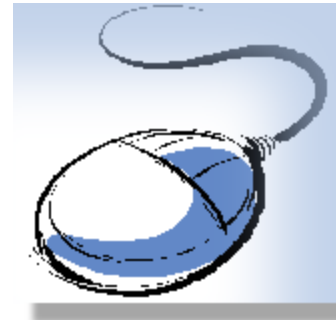


Communications

From Greenbacks to Lexis-Nexis

Online Computer Library

Founded in 1967 by Fred Kilgour of Columbus, OCLC Online Computer Library Center is a nonprofit, membership, computer library service and research organization dedicated to the public purposes of furthering access to the world's information and reducing information costs. More than 50,000 libraries in 84 countries and territories around the world use OCLC services to locate, acquire, catalog, lend and preserve library materials. Researchers, students, faculty, scholars, professional librarians and other information seekers use OCLC services to obtain bibliographic, abstract and full-text information when and where they need it. OCLC and its member libraries cooperatively produce and maintain WorldCat - the OCLC Online Union Catalog. The OCLC WorldCat database now has more than one billion entries. The billionth entry was made on August 11, 2005, by a Worthington Ohio librarian for the book entitled *The Monkees: The day-by-day story of the '60s TV pop sensation*.



In The Beginning...

In 1967, the presidents of the Ohio College Association founded the Ohio College Library Center (OCLC) to develop a computerized system in which the libraries of Ohio academic institutions could share resources and reduce costs.

OCLC's first offices were in the Main Library on the campus of The Ohio State University (OSU), and its first computer room was housed in the OSU Research Center. It was from these academic roots that Frederick G. Kilgour, OCLC's first president, oversaw the growth of OCLC from a regional computer system for 54 Ohio colleges into an international network.



Expanding Beyond Ohio

In 1977, the Ohio members of OCLC adopted changes in the governance structure that enabled libraries outside Ohio to become members and participate in the election of the Board of Trustees; the Ohio College Library Center became OCLC, Inc. In 1981, the legal name of the corporation became OCLC Online Computer Library Center, Inc. Today, OCLC serves more than 54,000 libraries of all types in the U.S. and 96 countries and territories around the world.

The Dewey Decimal Classification System



In 1988, OCLC purchased the Dewey Decimal Classification (DDC) system. It was devised by library pioneer Melvil Dewey in the 1870s, and provides a dynamic structure for the organization of library collections. The DDC is the world's most widely used library classification system. In the United States, 95 percent of all public and K-12 school libraries, 25 percent of college and university libraries, and 20 percent of special libraries use the DDC. More than 200,000 libraries worldwide in 135 countries count on the DDC to keep their collections organized so that their users can easily locate the resources they need. DDC has been translated into more than 30 languages. The Dewey Decimal Classification (DDC) system, devised by library pioneer Melvil Dewey in the 1870s and owned by OCLC since 1988, provides a dynamic structure for the organization of library collections.

About Frederick G. Kilgour

In 1974, the American Library Association (ALA) awarded OCLC Founder Frederick G. Kilgour the prestigious Margaret Mann Citation in Cataloging and Classification for "making the Library of Congress MARC database a practical and useful product." In 1982, Mr. Kilgour was awarded ALA's highest honor, Honorary Life Membership, for his contributions to librarianship, including "the establishment and development of a practical vehicle for making the benefits of technology readily available to thousands of libraries."

To honor Kilgour, the Frederick G. Kilgour Award for Research in Library and Information Technology is sponsored by OCLC Online Computer Center, Inc. and the Library and Information Technology Association (LITA), a division of the American Library Association. The purpose of the award is to bring attention to research relevant to the development of information technologies, especially work which shows promise of having a positive and substantive impact on any aspect of the publication, storage, retrieval and dissemination of information, or the processes by which information and data is manipulated and managed.

Find out more...

- [OCLC Online Computer Library Center](http://www.oclc.org)
(www.oclc.org)
- [Frederick G. Kilgour Award for Research in Library and Information Technology](http://www.ala.org/ala/lita/litaresources/litascholarships/litascholarships.htm#kilgour)
(www.ala.org/ala/lita/litaresources/litascholarships/litascholarships.htm#kilgour)
- [The Dewey Decimal Classification \(DDC\) System](http://www.oclc.org/dewey)
(www.oclc.org/dewey)
- [Take a tour of the DDC](http://www.oclc.org/dewey/resources/tour)
(www.oclc.org/dewey/resources/tour)



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Ohio's Legacy of Discovery & Innovation



Communications

From Greenbacks to Lexis-Nexis

Spencerian System of Penmanship

Platt R. Spencer developed the Spencerian system of penmanship. It explained how all the letters can be made gracefully and rapidly using various combinations of a few basic pen strokes. The Spencerian method was a phase of paleography or the study of language recording. Teachers in almost all American schools adopted the system in the late 19th century. He also developed a way of recording scientific observations that used by scientists everywhere for 70 years.



Spencer was born in 1800 in East Fishkill, NY as one of twelve children. It is said that Spencer learned to write on leather used by a nearby tannery, using dyes as ink. After his father's death, the family relocated to Ashtabula, Ohio, where as a child, Spencer was known to write with a stick in the white sand for hours.

In the 1800's, elegant handwriting was a much sought-after skill. Spencer's penmanship goal was to develop a system that would be comfortable to execute. He strove for natural writing positions, so that a person could write for hours without cramps or strains. He experimented with different methods of holding a pen, positions for the arm and fingers. Ultimately he found a system that was comfortable and produced lovely handwriting. He published his technique -- the Spencerian System of Penmanship -- in several books, many of which are still available for sale today. The Spencerian System took hold and was considered the most beautiful method to emulate.



Spencer served as an administrator of Bryant, Lusk and Stratton Business College in Cleveland. He also taught penmanship in Jefferson, Ohio and lectured on penmanship techniques at the Hiram Institute. Spencer was also known for his active interest in human rights and his anti-slavery efforts. He died in Geneva, Ohio in 1864.

Find out more...

- [Spencer Biography and Photo](http://www.zanerian.com/PRS.html)
(www.zanerian.com/PRS.html)
- [Spencer Biography at Myers University, Cleveland, OH](http://www.dnmyers.edu/myersHistory/chap3.htm)
(www.dnmyers.edu/myersHistory/chap3.htm)



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Ohio's Legacy of Discovery & Innovation



Communications

From Greenbacks to Lexis-Nexis

Nation's First Mass Medium

In 1878, Edward W. Scripps (1854-1926) borrowed \$10,000 from his brothers to set off America's first information revolution - beginning with the launch of a newspaper in Cleveland aimed at an emerging - but yet unserved - mass audience of urban workers. "The Penny Press," named for its affordable price, was clear, concise, and politically independent. It quickly became the model for the nation's first mass medium.



In the early 1920s, Scripps added "Howard" to the company's operating name to recognize the growing contribution of Roy W. Howard, an aggressive young newsman who rose to become president and chairman of the concern.



A few years later, Scripps launched United Press as a competitor to the Associated Press (AP). In 1958, United Press merged with Hearst's International News Service, and became United Press International (UPI). The E. W. Scripps Company next expanded to owning television stations and went public in 1988 on the New York Stock Exchange.

Scripps also nurtured a syndicated features service, initially built around the writing of his sister, into a licensing and syndication company that thrives today as "United Media."



The next venue for expansion proved to be cable television, with the launch of Home & Garden Television in 1994. E. W. Scripps then developed the Do It Yourself channel in 1999, and Fine Living in 2002. E.W. Scripps also owns Summit American Television, which consists of 5 television stations, including Shop At Home, the fourth-largest home shopping network.

The E. W. Scripps Company is now the ninth-largest newspaper publisher in the United States, with 21 daily newspapers and a combined total circulation of 1.2 million. Newspapers account for 50 percent of revenue,

while its ten television stations (including the Food Network and HGTV) make up another 20 percent.

Did You Know?

- The E.W. Scripps Company is a diverse media concern with interests in newspaper publishing, broadcast television, national television networks and interactive media.
- Scripps operates 21 daily newspapers, 10 broadcast TV stations and three cable television networks, with plans to launch a fourth.
- Scripps national television network brands include Home & Garden Television, Food Network, Do It Yourself and Fine Living, launched in 2002.
- The company also operates Scripps Howard News Service, United Media, the worldwide licensing and syndication home of PEANUTS and DILBERT, and 31 Web sites, including hgtv.com, foodtv.com, diy.net.com and comics.com.
- Scripps often ran his business from his homes.
- One legacy of Edward W. Scripps also continues in the form of Science Service, a nonprofit science education and publishing organization founded by Scripps more than 80 years ago. Founded in 1921, Science Service advances public understanding and appreciation of science around the globe through publications and educational programs. Science Service has encouraged students, parents, teachers, and communities to explore the vast world of science. Science Service is the parent of the Intel International Science and Engineering Fair and the weekly Science News magazine. Through publications and programs, science fairs and scholarship competitions, Science Service helps young people utilize and strengthen their knowledge in science, math, and engineering. Many credit these experiences as a decisive factor in choosing a scientific career. A member of the Ohio Academy of Science, the late David Dietz (1897-1984) was the first science editor on an American newspaper (the Cleveland Press in 1921) and one of the first board members of Science Service.

Find out more...

- [E.W. Scripps Company History](http://www.scripps.com/corporateoverview/history/)
(www.scripps.com/corporateoverview/history/)
- [History Timeline](http://www.scripps.com/corporateoverview/history/timeline1.shtml)
(www.scripps.com/corporateoverview/history/timeline1.shtml)



Communications

From Greenbacks to Lexis-Nexis

Automated Price Tags

Frederick Kohnle, of Dayton, in 1902 invented the first successful machine for automatically putting price tags on merchandise sold in stores and shops. At a single stroke of the operating handle, the machine formed a tag from a roll of paper, imprinted it with price and other information, formed a wire staple, and stapled the tag to the merchandise. It eliminated the time consuming need for handmade price tags written with pen and ink.



Stores were getting bigger around the turn of the century, and carrying a bigger variety of merchandise. Fast disappearing were the days when the store clerk memorized the price of every article on the shelves. One price sign on the shelf, or the merchandise display, gave that information to buyers. In some cases, everyone knew what staple items like salt or flour cost, and there was no posted price.

But big departments stores were opening, however, and clerks sometimes got confused, and charged the wrong amount. Putting an individual price tag on each item was becoming more important. Automated pricing, however, was still a dream.



Kohnle got the idea from watching store clerks laboriously hand price items. In 1891, he patented a paper price tag with fastening device and founded the Automatic Pin Ticketing Machine Co. to make the machines.

Like other inventors, Kohnle realized that he didn't have to reinvent the wheel, but could learn from the experiences of others. He bought patent rights to other automatic pricing machines, and incorporated those ideas into a better version of his machine. By 1902, he had a ticketing machine ready for the market. And he continued research and development, making and patenting improved versions, including a floor-mounted machine operated with a foot pedal.

Eventually, Kohnle developed a partnership to explore the development and marketing of his marking machine systems. As a result, the Monarch Marking System Company was founded in 1920. The company name is still synonymous with pricing machines, though the current models are hand-held devices.

UPC Codes

Kohnle's invention was the first step toward the fully automated Universal Product Code (UPC) – the “bar codes” – adopted by the grocery industry in 1973. Bar codes now are used to price, identify, and track all kinds of items, ranging from groceries to blood donated for transfusion. In stores, bar codes not only display an item's price, but also tell the computer to subtract that item from inventory, so the manager knows when to order more stock.

Find out more...

- Monarch Automatic Identification, Pricemarking and Barcode Products (<http://www.monarch.com/>)
- The Ohio University Center for Automatic Identification (<http://www.ent.ohiou.edu/autoid/>)



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Communications

From Greenbacks to Lexis-Nexis

First Radio Station

Inventors Lee deForest and Frank Butler First established the first radio broadcasting station in Toledo in 1907. The station was housed in the National Bank Building.



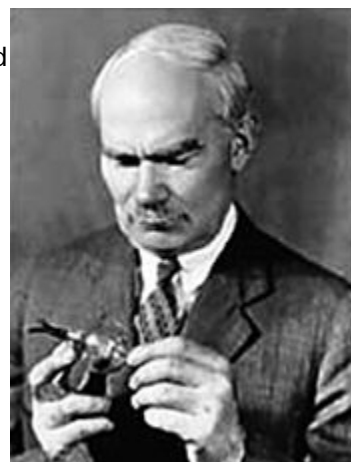
About Lee deForest

Lee deForest, had over 180 patents - among them the audion, a vacuum tube that amplified electrical signals. Later, deForest sold the audion patent to AT&T.

As a child deForest loved anything mechanical. He tinkered with machines, and as a teen was building miniaturized blast furnaces and locomotives, and also devised a silverplating mechanism.

deForest studied at Yale University, and did his dissertation on high-frequency oscillation effects in parallel wires. It was one of the first treatises on radio waves and explored the possibilities of wireless communication.

His first job was with Western Electric Company in Chicago, where he started in the telephone department and then moved on to work in the experimental laboratory.



In 1907 saw the launch of the DeForest Radio Company. An early company advertisement stated: "It will soon be possible to distribute grand opera music from transmitters placed on the stage of the Metropolitan Opera House by a Radio Telephone station on the roof to almost any dwelling in Greater New York and vicinity... The same applies to large cities. Church music, lectures, etc., can be spread abroad by the Radio Telephone."

For the next ten+ years deForest broadcasted from points all over the world, popularizing radio to the point that by the 1920's many U.S. homes had their own "radio sets."

Lee deForest also was a strong writer, frequently contributing to scientific journals or electronics publications. In 1950, he wrote an autobiography called "Father of Radio." He also wrote several film scripts, hundreds of poems, and kept a daily journal. deForest died in 1961 and was inducted into the Radio Hall of Fame in 1989.



Find out more...

- **Complete Lee De Forest**
(<http://www.leedeforest.org/>)
- **PBS: QuickTime Movie of Lee De Forest's Audion**
(www.pbs.org/transistor/quicktimes/movieclips/monkeysVIDEO/monkeysVIDEO_MSTR.mov)
- **Founding Fathers of Early Broadcasting**
(<http://radio.about.com/cs/foundingfathers/>)
- **Lee deForest History and Photos**
(<http://chem.ch.huji.ac.il/~eugeniik/history/deforest.htm>)
- **Early U.S. Radio History**
(<http://earlyradiohistory.us/>)
- **IEEE History Center: Lee De Forest**
(www.ieee.org/organizations/history_center/legacies/deforest.html)
- **National Inventors Hall of Fame's Lee De Forest**
(www.invent.org/hall_of_fame/40.html)





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Father of American Telecommunications

Theodore Newton Vail, born in Carroll County in 1845, oversaw construction of America's first transcontinental telephone system while president of the American Telephone and Telegraph Company. It became operational in 1914, and offered transcontinental service a year later. It gave AT&T an edge in long-distance telephone service that it held for almost a century. Vail was firmly committed to scientific research and in 1907 organized the famed Bell Telephone Laboratories, which had won a dozen Nobel Prizes and done research that impacted the lives of millions of people.



Transcontinental Telephone History: July 1914

For five years AT&T had placed audions (the first vacuum tubes) along some 3,400 miles of wires that connected the U.S. coasts. Because voice signals gradually weakened the further along they traveled, a boost of the signal was needed to complete a "long distance" transmission. The audions boosted the signal as it passed along the wire, and the first trial took place in July, 1914, when Theodore Vail (then President of AT&T) spoke for the first time from one coast to the other. His voice was boosted in several spots along the way. The previous record for a long distance call was from New York to Denver - but this call required those on each end to shout.

The twist to the invention took place a year later, when Alexander Graham Bell from New York spoke the words he had originally said to test the basic phone decades earlier: "Mr. Watson, come here. I want you." This time, however, Thomas Watson, was now in San Francisco, and replied, "It will take me five days to get there now!" Not many years later, in 1923, transatlantic transmission was demonstrated.

Find out more...

- [Photo of AT&T President Theodore Vail at opening ceremony for first transcontinental telephone line](http://www.att.com/history/milestone_1915.html)
(www.att.com/history/milestone_1915.html)
- [Bell Laboratories History](http://www.bell-labs.com/history)
(www.bell-labs.com/history)
- [Bell System Memorial Article on Theodore Newton Vale](http://www.bellsystemmemorial.com/bellsystem_history.html#Year%20of%20Decision)
(www.bellsystemmemorial.com/bellsystem_history.html#Year of Decision)
- [SCTE Article: History and Regulation of the Telephone Industry](http://www.scte.org/chapters/newengland/reference/Telephony/topic01.htm)
(www.scte.org/chapters/newengland/reference/Telephony/topic01.htm)



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Tickertape Machine

Samuel Spahr Laws (1824-1921), a Cincinnati gold broker, invented the tickertape machine, a device that transmitted stock prices on a long strip of paper that was cut and pasted for a permanent record. His patent (No. 72,742) was issued on December 31, 1867, and titled "Electrical Indicator." The New York Stock Exchange first adopted this early form of text messaging in 1867 for stock quotes, and the machines quickly went into businesses around the country.



Laws, a one time resident of Troy, Ohio, graduated in 1848 from Ohio's Miami University as the valedictorian of his class.

Did You Know?

- During his career, Laws hired a 22 year old inventor named Thomas A. Edison. Edison reportedly helped refine the ticker tape machine.

Find out more...

- [New York Stock Exchange](http://www.nyse.com/)
(<http://www.nyse.com/>)
- [The Henry Ford - Edison Biography](http://www.hfmgv.org/exhibits/edison/)
(www.hfmgv.org/exhibits/edison/)
- [Canada Science and Technology Museum](http://www.sciencetech.technomuses.ca/english/collection/conn5.cfm)
(www.sciencetech.technomuses.ca/english/collection/conn5.cfm)





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Communications

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TinType Photography

In 1856, Hamilton L. Smith, while a professor of chemistry and physics at Kenyon College in Gambier, patented the ferrotype in America, popularly known as the tintype. In its 19th century heyday, tintypes were the equivalent of today's digital photography in that they provided inexpensive images quickly.



Many images of the Civil War were tintypes. Recorded on a thin metal (not tin) plate, the relatively permanent and indestructible images could be mailed easily, and many survive today, providing an excellent and detailed "snapshot" history of America and the world from the mid to late 19th century.

Some tintype cameras allowed four images of the same view to be made simultaneously. Then the metal plate could be cut into four different images. Common tintypes are about 2¼ x 3½ inches, but it was the size of the camera back that determined how large the resulting image would be. Most tintype images today have rough edges and are not evenly cut, which is part of their charm.



One of the greatest advances of tintype was that it brought photography to the masses. It was relatively inexpensive. Prior to tintype, photography was reserved for the wealthy. Tintypes became so popular that they were produced for a century and were still being shot broadly as late as the 1950's - frequently at county fairs.

Did You Know?

- Smith was also curator of specimens that formed the foundation of the collections in the Cleveland Museum of Natural History.
- Smith wrote several textbooks and also devised a system for describing diatoms and desmids.
- A very popular use of tintypes was to photograph the dead.
- The term "tintypes" may be linked to the tin shears used to cut out the images.
- To tell if you have a tintype, see if it will attract a magnet. The iron in tintypes is a distinguishing feature.
- The tintype is more accurately called a ferrotype.



Find out more...

- [The Tintype Process](http://www.rleggat.com/photohistory/history/tintype.htm)
(www.rleggat.com/photohistory/history/tintype.htm)
- [About Tintype](http://www.city-gallery.com/learning/types/tintype/index.php)
(www.city-gallery.com/learning/types/tintype/index.php)



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Communications

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Weekly Reader

Eleanor Johnson in 1928 published the first copy of *Weekly Reader* in Columbus to introduce elementary school pupils to world news and opinion. The newspaper is used in about 90 percent of American school districts.



About Weekly Reader

Weekly Reader Corporation, began with the publication of the first Current Events in 1902. The best known of *Weekly Reader's* publications is *Weekly Reader*, a newspaper designed especially with content for elementary school children. *Weekly Reader* was founded in 1928 by Eleanor Johnson. At the time, Johnson was Director of Elementary Schools in York, PA. She was a great supporter of reading and known as a "reading expert." The first edition of *Weekly Reader* for fourth graders appeared with the new school year in September, 1928. The headline for that first issue focused on presidential candidates Herbert Hoover and Al Smith: "Two Poor Boys Who Made Good Are Now Running for the Highest Office in the World!" The publication also included a poem exploring the benefits of consuming cod-liver oil.

Since 1928, some 18 billion copies of the children's news weekly have kept the nation's students abreast of world news and interesting information. Known for its quality and integrity, *Weekly Reader* is read by hundreds of thousands of teachers and millions of children all over the United States. Over the years the publication expanded until 1959 when it included Kindergarten through Grade 6. Recognizing the need for early reading support materials, *Weekly Reader* added a pre-kindergarten edition in 1980. *Weekly Reader* now serves more than 11 million schoolchildren (pre-k through high school) in over 60,000 schools. The company currently publishes other periodicals and instructional materials, including *Teen Newsweek*, *Read*, *Current Science*, *Know Your World Extra*, and *Current Health*, *Career World*, and its founding publication, *Current Events*.

Online Weekly Reader

In celebration of its 100th anniversary in 2002, *Weekly Reader* enhanced its online resources (found at www.weeklyreader.com) with a broad database for teachers, called the *WRToolkit*. The new *WRToolkit* offers current and archived issues of *Weekly Reader* which are easily searchable by topic and grade. The *Toolkit* also has a searchable archive, extension activities, graphs, charts and quizzes to reinforce the curriculum. There is also access to special features that draw upon *The World Almanac for Kids* and the Funk & Wagnalls New Encyclopedia.

Find out more...

- [History of Weekly Reader](http://www.weeklyreader.com/corporate/story.asp) (www.weeklyreader.com/corporate/story.asp)



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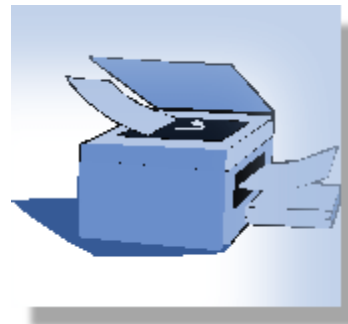


Communications

From Greenbacks to Lexis-Nexis

Xerox Copies

Researchers at the Battelle Memorial Institute in Columbus in the 1940s developed many of the technical innovations that made xerography possible. The xerographic (dry-copying) method had been invented in 1937 by Chester Carlson, a New York City patent attorney, but was little more than a curiosity until Battelle and the Haloid Company (now the Xerox Corporation) solved mechanical engineering problems needed to build Xerox machines. After a myriad of design changes and the challenges of pricing and marketing, Xerox introduced its first office copier in 1958, ten years before Carlson's death.



As a high school student, Carlson needed funding to help support his ailing parents. To raise funds, he published a chemical magazine. Making copies of the magazine was a challenge, and he developed an interest in the printing process. He earned a physics degree at the California Institute of Technology and began his career at the electronics firm P.R. Mallory Company, working in the patent department in 1930.

As part of his work at Mallory, Carlson was expected to review documents and drawings, and to register inventions. Because the patent office required several copies of each document and drawing, Carlson had to duplicate manually. It's clear why Carlson thought a duplicating machine might be a valuable invention. Carlson also was nearsighted and had some arthritis, which likely made his work even more challenging.

Before Xerox Copies?

Before the photocopier, many processes for copying were used around the world. A few of the more popular methods were the ditto, the Gestetner, and the hectograph. The hectograph is a simple way to copy, with a master copy written with a special ink and pressed into a tray of gelatine. The ditto process makes about twenty-five copies, by typing a special ink on a master sheet. The master is mounted onto a drum, and methyl alcohol dissolves a small amount of ink which is transferred to a blank sheet of paper. The Gestetner is a method of stencil duplication, manufactured in large in Britain by the 1880s. Of course, many more copying techniques have existed.

Thanks to the engineers at Battelle, duplicating has become inexpensive, reliable, and convenient.

Find out more...

- [Xerox Photocopiers, Xerography and Chester Carlson](http://inventors.about.com/library/inventors/blxerox.htm) (<http://inventors.about.com/library/inventors/blxerox.htm>)
- [Xerox Corporation](http://www.xerox.com) (www.xerox.com)
- [Chester Carlson Patents](http://www.lib.rochester.edu/index.cfm?PAGE=399) (www.lib.rochester.edu/index.cfm?PAGE=399)