Scientific Societies

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1 The Royal Society

From Wikipedia, the free encyclopedia. The Royal Society of London for the Improvement of Natural Knowledge, known simply as The Royal Society, is a learned society for science that was founded in 1660 and claims to be the oldest such society still in existence. Although a voluntary body, it serves as the academy of sciences of the United Kingdom (in which role it receives 40 million annually from the UK Government).

The Royal Society of Edinburgh (founded 1783) is a separate Scottish body. The Royal Irish Academy (founded 1785) is a separate Irish body.

History.

The Royal Society was founded in 1660, only a few months after the Restoration of King Charles II, by members of one or two either secretive or informal societies already in existence. The Royal Society enjoyed the confidence and official support of the restored monarchy. The "New" or "Experimental" form of philosophy was generally ill-regarded by the Aristotelian (and religious) academies, but had been promoted by Sir Francis Bacon in his book The New Atlantis. Robert Boyle refers to the "Invisible College" as early as 1646. A founding meeting was held at the premises of Gresham College in Bishopsgate on 28 November 1660, immediately after a lecture by Sir Christopher Wren, who was at that time Gresham Professor of Astronomy. At a second meeting a week later, Sir Robert Moray, an influential Freemason who had helped organise the public emergence of the group, reported that the King approved of the meetings. The Royal Society continued to meet at the premises of Gresham College and at Arundel House,

the London home of the Dukes of Norfolk, until it moved to its own premises in Crane Court in 1710.

A formal Royal Charter of incorporation passed the Great Seal on 15 July 1662, creating "The Royal Society of London", with Lord Brouncker as the first President, and Robert Hooke was appointed as Curator of Experiments in November 1662. A second Royal Charter was sealed on 23 April 1663, naming the King as Founder and changing the name to "The Royal Society of London for the Improvement of Natural Knowledge". The motto of the Royal Society, "Nullius in Verba" (Latin: "On the words of no one",The full quote from Horace – Nullius The premises of The Royal Society, 6-9 Carlton addictus judicare in verba magestri – expands into the gold standard of objectivity: "Not compelled to swear to any master's words." although the Royal Society itself now prefers the translation "Nothing in words",[2]and its erstwhile president Robert May favours "Respect the facts"[3]), signifies the Society's commitment to establishing the truth of scientific matters through experiment rather than through citation of authority. Although this seems obvious today, the philosophical basis of the Royal Society differed from previous philosophies such as Scholasticism, which established scientific truth based on deductive logic, concordance with divine providence and the citation of such ancient authorities as Aristotle. Historical philosophy and significance The Royal Society imagined a network across the globe as a public enterprise, an "Empire of Learning", and strove to remove language barriers within the sciences. The Royal Society was dedicated to the free flow of information and encouraged communication.

Boyle, in particular, began the practice of reporting his experiments in great detail so that others could replicate them, unlike previous alchemists. Sir Isaac Newton was a practising alchemist and his assistant, J. T. Desaguliers, a demonstrator for the Royal Society, was a prominent Freemason and Grand Master of the Premier Grand Lodge of England. During the eighteenth century, masonic lodges in France became conduits for circulating scientific texts which could not be made available publicly (see John Toland). While the proceedings of the Royal Society reported for instance Chinese alchemists' immortality potions as fact, the Royal Society did actually put the superstitions then current to rigorous testing, for instance placing a spider on a table and sprinkling a circle of salt around it; on the theory that it could not walk across the salt. The spider promptly left the circle, thus disproving that myth. Reform In 1821 Humphry Davy became president and marked a

shift in membership towards practising scientists, rather than gentlemen and amateurs. The Industrial Revolution and the needs of business had alerted society to the demand for a professional body for leading scientists. However, the Society's royal charter guaranteed the Fellows an unfettered right to elect to Fellowship whoever they chose and regulation of the number of new members and their scientific qualifications became a pressing concern. In 1823, a committee was established to review the statutes of the Society but it was only in 1827 that the question of membership was considered. James South succeeded in establishing a committee to "consider the best means of limiting the members admitted to the Royal Society, as well as to make such Suggestions on that subject as may seem to them conducive to the Welfare of the Society." However, the committee, chaired by William Hyde Wollaston and comprising South, Davies Gilbert, John Herschel, Thomas Young, Charles Babbage, Francis Beaufort and Henry Kater, had little impact when it reported.[4] A new crisis was precipitated when Davy resigned as president in July 1827. Gilbert canvassed Sir Robert Peel as a new president. Peel had been an important political intermediary in establishing the Royal Medals, but many were appalled at the prospect of a political, rather than scientific, president. In the face of a deadlock, Davies took the presidency for the remainder of the year but was then succeeded by two non-scientists; first the Duke of Sussex, and then the Marquess of Northampton.

In 1846, the Society established a Charters Committee "with a view to obtaining a supplementary Charter from the Crown", and a particular remit to consider the membership issue. When he was elected to the Council that year, William Robert Grove was co-opted to the committee, his experience in both science and law making him particularly qualified.

A selected list of Presidents:

.. Sir Christopher Wren (1680-1682)
.. Samuel Pepys (1684-1686)
.. Charles Montagu (1695-1698)
.. The Lord Somers (1698-1703)
.. Sir Isaac Newton (1703-1727)
.. Joseph Banks (1778-1820)
.. Sir Humphry Davy (1820-1827)
.. Prince Augustus, Duke of Sussex (1830-1838)
.. William Parsons, 3rd Earl of Rosse (1848-1854)
.. Sir Joseph Dalton Hooker (1873-1878)
.. Thomas Henry Huxley (1883-1885)
.. George Gabriel Stokes (1885-1890)
.. William Thomson, 1st Baron Kelvin (1890-1895)
.. Joseph Lister, 1st Baron Lister (1895-1900)

.. Sir William Huggins (1900-1905)
.. John William Strutt, 3rd Baron Rayleigh (1905-1908)
.. Sir Joseph John Thomson (1915-1920)
.. Sir Ernest Rutherford (1925-1930)
.. Sir William Henry Bragg (1935-1940)
.. Sir Henry Hallett Dale (1940-1945)
.. Robert May, Baron May of Oxford (2000-2005)
.. Martin Rees, Baron Rees of Ludlow (2005-)

2 The Lunar Society

The Lunar Society was a dinner club and informal learned society of prominent industrialists, natural philosophers and intellectuals who met regularly between 1765 and 1813 in Birmingham, England. At first called the Lunar Circle, 'Lunar Society' became the formal name by 1775. The name arose because the society would meet during the full moon, when the extra light made the journey home easier and safer (in the absence of street lighting). The members cheerfully referred to themselves as "lunaticks", a pun on lunatics. Venues included Erasmus Darwin's home in Lichfield, Matthew Boulton's home, Soho House, and Great Barr Hall. Members The members of the Lunar Society were very influential in Britain. Amongst those who attended meetings more or less regularly were Matthew Boulton, Erasmus Darwin, Samuel Galton Junior, James Keir, Joseph Priestley, Josiah Wedgwood, James Watt, John Whitehurst and William Withering. More peripheral characters and correspondents included Sir Richard Arkwright, John Baskerville, Thomas Beddoes, Thomas Day, Richard Lovell Edgeworth, Benjamin Franklin, Thomas Jefferson, Anna Seward, William Small, John Smeaton, William Strutt, Thomas Wedgwood, John Wilkinson, Joseph Wright, James Wyatt, Samuel Wyatt, and Staffordshire member of parliament and investor John Levett. Antoine Lavoisier frequently corresponded with various members of the group, as did Benjamin Franklin, who also visited them in Birmingham on several occasions. As the members grew older and died, the Lunar Society ceased to be very active and was closed in 1813. Most former members had died by 1820. Among memorials to the Society and its members are the Moonstones; two statues of Watt and a statue of Boulton, Watt and Murdoch, by William Bloye; and the museum at Soho House all in Birmingham, England. Modern Lunar Society In more recent times a new Lunar Society was formed in Birmingham, England by a group

led by Dame Rachel Waterhouse with the aim of playing a leading part in the development of the city and the wider region. Further reading:
Uglow, Jenny **The Lunar Men: Five Friends Whose Curiosity Changed the World** Faber and Faber (2002)

3 Benjamin Franklin: The Junto

The Junto was a club established in 1727 by Benjamin Franklin for mutual improvement in Philadelphia. Also known as the Leather Apron Club, its purpose was to debate questions of morals, politics, and natural philosophy, and to exchange knowledge of business affairs. History Franklin organized a group of friends to provide a structured forum for discussion. The group, initially composed of twelve members, called itself the Junto (the word is a mistaken use of the masculine singular Spanish adjective "joined", mistaken for the feminine singular noun "junta", "a meeting". Both derive from Latin "junct-", past participle of "jungere", "to join"). The members of the Junto were drawn from diverse occupations and backgrounds, but they all shared a spirit of inquiry and a desire to improve themselves, their community, and to help others. Among the original members were printers, surveyors, a cabinetmaker, a cobbler, a clerk, and a merchant. Although most of the members were older than Franklin, he was clearly their leader. At just 21 years of age, he oversaw five men, including Hugh Meredith, Stephen Potts, and George Webb, who were soon to form the core of the Junto. Franklin was an outgoing, social individual and had become acquainted with some of the businessmen at a club called the Every Night Club. This gathering included prominent merchants who met informally to drink and discuss the business of the day. Franklins congenial ways attracted many unique and learned individuals, and from these, he selected the members for the Junto. All members lived in Philadelphia and came from diverse areas of interest and business. Along with Meredith, Potts and Webb, they included Joseph Breintnall, merchant and scrivener, who also loved poetry and natural history. Thomas Godfrey was a glazier, mathematician and inventor, and Nicholas Scull and William Parsons were both surveyors. Scull was also a bibliophile and Parsons a cobbler and astrologer. William Maugridge was a cabinetmaker, William Coleman a merchants clerk, and Robert Grace a gentleman. Graces wealth meant he did not have to work, but apparently he

brought an intellectual element to the group, plus a fine library. The twelfth member of the Junto remained a mystery until 2007, when Professor George Boudreau of Penn State discovered a long-forgotten account of the club's refreshments, and verified that shoemaker John Jones, Jr. was an original member. Jones was a Philadelphia Quaker, a neighbor of Franklin's, and later a founding member of the Library Company of Philadelphia. The club met Friday nights, first in a tavern and later in a house, to discuss moral, political and scientific topics of the day. Franklin describes the formation and purpose of the Junto in his autobiography: I should have mentioned before, that, in the autumn of the preceding year, [1727] I had form'd most of my ingenious acquaintance into a club of mutual improvement, which we called the Junto; we met on Friday evenings. The rules that I drew up required that every member, in his turn, should produce one or more queries on any point of Morals, Politics, or Natural Philosophy, to be discuss'd by the company; and once in three months produce and read an essay of his own writing, on any subject he pleased. Our debates were to be under the direction of a president, and to be conducted in the sincere spirit of inquiry after truth, without fondness for dispute or desire of victory; and to prevent warmth, all expressions of positiveness in opinions, or direct contradiction, were after some time made contraband, and prohibited under small pecuniary penalties.

4 Institute of Electrical and Electronics Engineers or IEEE

The IEEE is incorporated in the State of New York, United States. It was formed in 1963 by the merger of the Institute of Radio Engineers (IRE, founded 1912) and the American Institute of Electrical Engineers (AIEE, founded 1884).

The major interests of the AIEE were wire communications (telegraph and telephony) and light and power systems. The IRE concerned mostly radio engineering, and was formed from two smaller organizations, the Society of Wireless and Telegraph Engineers and the Wireless Institute. With the rise of electronics in the 1930s, electronics engineers usually became members of the IRE, but the applications of electron tube technology became so extensive that the technical boundaries differentiating the IRE and the AIEE

became difficult to distinguish. After World War II, the two organizations became increasingly competitive, and in 1961, the leadership of both the IRE and the AIEE resolved to consolidate the two organizations. The two organizations formally merged as the IEEE on January 1, 1963.

Notable Presidents of IEEE and its founding organizations include Elihu Thomson (AIEE, 1889-1890), Alexander Graham Bell (AIEE, 1891-1892), Charles Proteus Steinmetz (AIEE, 1901-1902), Lee De Forest (IRE, 1930), Frederick E. Terman (IRE, 1941), William R. Hewlett (IRE, 1954), Ernst Weber (IRE, 1959; IEEE, 1963), and Ivan Getting (IEEE, 1978).

5 The American Institute of Electrical Engineers

The American Institute of Electrical Engineers was a United States based organization of electrical engineers that existed between 1884 and 1963 (when it merged with the Institute of Radio Engineers (IRE)). The 1884 founders of the American Institute of Electrical Engineers (AIEE) included some of the most prominent inventors and innovators in the then new field of electrical engineering, among them Thomas Alva Edison, Elihu Thomson, Edwin J. Houston, and Edward Weston. The purpose of the AIEE was stated "to promote the Arts and Sciences connected with the production and utilization of electricity and the welfare of those employed in these Industries: by means of social intercourse, the reading and discussion of professional papers and the circulation by means of publication among members and associates of information thus obtained." The first president of AIEE was Norvin Green, president of the Western Union Telegraph Company. Other notable AIEE presidents were Alexander Graham Bell (1891-1892), Charles Proteus Steinmetz (1901-1902), Schuyler S. Wheeler (1905-1906), Dugald C. Jackson (1910-1911), Michael I. Pupin (1925-1926), and Titus G. LeClair (1950-1951).

The first technical meeting of the AIEE was held during the 1884 International Electrical Exhibition, in Philadelphia, Pennsylvania (October 7-8, at the Franklin Institute). After several years of operating primarily in New York, the AIEE authorized local sections in 1902. These were formed first in the United States (Chicago and Ithaca, 1902) and then in other countries

(the first section outside the US was Toronto, established 1903). The AIEE regional structure was soon complemented by a technical structure the first technical committee of AIEE (the High Voltage Transmission Committee) was formed in 1903. Standardization work started in 1891 with the formation of a committee on units and standards, followed by a committee on standard wiring.

The formation of the AIEE Subcommittee on Large-Scale Computing in 1946 is considered a key milestone in the history of computer engineering. It was the first time that a professional association recognized the significance of computers and computing in electro-technology.

The early technical areas of interest of AIEE were electric power, lighting, and wired communications. Radio and wireless communications became the major focus of a rival organization, the Institute of Radio Engineers (IRE, established 1912). The dynamic growth of radio technology and the emergence of the new discipline of Electronics in the 1940s led to stiff competition between AIEE and IRE, with IRE showing faster growth in the 1950s and early 1960s, and attracting more students. In 1957, IRE, with approximately 55,500 members, surpassed AIEE in membership size; in 1962 IRE had 96,500 members to AIEEs 57,000.

AIEE and IRE merged in 1963 to form the Institute of Electrical and Electronics Engineers (IEEE).

Retrieved from "http://en.wikipedia.org/wiki/American_Institute_of_Electrical_Engineers"

6 American Mathematical Society

History It was founded in 1888 as the New York Mathematical Society, the brainchild of Thomas Fiske who was impressed by the London Mathematical Society on a visit to England. John Howard Van Amringe was the first president and Fiske became secretary. The society soon decided to publish a journal, but ran into some resistance, due to concerns about competing with the American Journal of Mathematics. The result was the Bulletin of the New York Mathematical Society, with Fiske as editor-in-chief. The de facto journal, as intended, was influential in increasing membership.

In July, 1894, the society reorganized under its present name and became a national society. In 1951, the headquarters moved from New York City to Providence, Rhode Island. The society added an office in Ann Arbor,

Michigan in 1984 and an office in Washington, D.C. in 1992.

The popularity of the Bulletin soon led to Transactions of the American Mathematical Society and Proceedings of the American Mathematical Society, which were also de facto journals. It was not until 1988 that the Journal of the American Mathematical Society was created, with the intent of being the flagship journal of the AMS.

Presidents

[edit] 1888 1900
John Howard Van Amringe (New York Mathematical Society) (1888-1890)
Emory McClintock (New York Mathematical Society) (1891-94)
George Hill (1895-96)
Simon Newcomb (1897-98)
Robert Woodward (1899-1900)

[edit] 1901 1950
Eliakim Moore (1901-02)
Thomas Fiske (1903-04)
William Osgood (1905-06)
Henry White (1907-08)
Maxime Bcher (1909-10)
Henry Fine (1911-12)
Edward Van Vleck (1913-14)
Ernest Brown (1915-16)
Leonard Dickson (1917-18)
Frank Morley (1919-20)
Gilbert Bliss (1921-22)
Oswald Veblen (1923-24)
George Birkhoff (1925-26)
Virgil Snyder (1927-28)
Earle Raymond Hedrick (1929-30)
Luther Eisenhart (1931-32)
Arthur Coble (1933-34)
Solomon Lefschetz (1935-36)
Robert Moore (1937-38)
Griffith Evans (1939-40)
Marston Morse (1941-42)
Marshall Stone (1943-44)
Theophil Hildebrandt (1945-46)
Einar Hille (1947-48)
Joseph Walsh (1949-50)

[edit] 1951 2000
John von Neumann (1951-52)
Gordon Whyburn (1953-54)
Raymond Wilder (1955-56)
Richard Brauer (1957-58)
Edward McShane (1959-60)
Deane Montgomery (1961-62)
Joseph Doob (1963-64)
Abraham Albert (1965-66)
Charles Morrey, Jr. (1967-68)
Oscar Zariski (1969-70)
Nathan Jacobson (1971-72)

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Saunders Mac Lane (1973-74)
Lipman Bers (1975-76)
R. H. Bing (1977-78)
Peter Lax (1979-80)
Andrew Gleason (1981-82)
Julia Robinson (1983-84)
Irving Kaplansky (1985-86)
George Mostow (1987-88)
William Browder (1989-90)
Michael Artin (1991-92)
Ronald Graham (1993-94)
Cathleen Morawetz (1995-96)
Arthur Jaffe (1997-98)
Felix Browder (1999-2000)

[edit] 2001
Hyman Bass (2001-02)
David Eisenbud (2003-04)
James Arthur (2005-06)
James Glimm (2007-08)
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7 The Franklin Institute

Founded in honor of Benjamin Franklin, The Franklin Institute is a museum in Philadelphia, Pennsylvania, and one of the oldest and premier centers of science education and development in the United States.

On February 5, 1824, Samuel Vaughn Merrick and William H. Keating founded The Franklin Institute of the State of Pennsylvania for the Promotion of the Mechanic Arts. The Franklin Institute was integrated in 1870, when Philadelphia teacher and activist Octavius Catto was admitted as a member. The museum began in 1825 in its original building at 15 South 7th Street (now the site of the Atwater Kent Museum) and moved into its current home on the Benjamin Franklin Parkway over 100 years later, in 1934. Funds to build the new Institute and Memorial on the Parkway came from the Poor Richard Club, the City Board of Trust, the Benjamin Franklin Memorial, Inc., and The Franklin Institute. John T. Windrim's original design was a completely square building surrounding the Benjamin Franklin Statue, which had yet to be built. Despite the effects of the Great Depression, the Benjamin Franklin Memorial, Inc. raised 5 million dollars between December 1929 and June 1930. Only two of the four wings envisioned by Windrim were built.

Over the years of its existence, many famous scientists have demonstrated groundbreaking new technology at the Franklin Institute. Nikola

Tesla demonstrated the principle of wireless telegraphy at the institute in 1893. Later, on 25 August 1934, Philo Taylor Farnsworth gave the world's first public demonstration of an all-electronic television system.

On March 31, 1940, press agent William Castellini issued a press release stating that the world would end the next day. The story was picked up by KYW, which reported, "Your worst fears that the world will end are confirmed by astronomers of Franklin Institute, Philadelphia. Scientists predict that the world will end at 3 p.m. Eastern Standard Time tomorrow. This is no April Fool joke. Confirmation can be obtained from Wagner Schlesinger, director of the Fels Planetarium of this city." This caused a panic in the city which only subsided when the Franklin Institute assured people it had made no such prediction. Castellini was dismissed shortly thereafter.[1]

8 The American Chemical Society

The American Chemical Society (ACS) is a learned society (professional association) based in the United States that supports scientific inquiry in the field of chemistry. Founded in 1876 at New York University, the ACS currently has over 160,000 members at all degree-levels and in all fields of chemistry, chemical engineering and related fields.

The American Chemical Society had it origins in a small group of 35 chemists that met on April 6, 1876, at the University Building in the present day New York University.[1] Although at that time there was an American science society (American Association for the Advancement of Science), the growth of chemistry prompted those assembled, including William H. Nichols, under the direction of Professor Charles F. Chandler of the Columbia School of Mines, to found the American Chemical Society. The society, Chandler said, would prove a powerful and healthy stimulus to original research, would awaken and develop much talent now wasting in isolation, [bring] members of the association into closer union, and ensure a better appreciation of our science and its students on the part of the general public.

A formal vote for organization was taken, a constitution was adopted, and officers were selected. Chandler was an obvious choice as president since he had been instrumental in establishing the society, however, he felt that New York University Professor John William Draper had the reputation as a scientist to lead a national organization. At the age of 65, Draper was elected

as the first president of the American Chemical Society and the headquarters was located in New York. Drapers presidency was important more due to his name and reputation than his active participation in the society

9 American Association for the Advancement of Science

The American Association for the Advancement of Science was created on September 20, 1848 in Pennsylvania. It was a reformation of the Association of American Geologists and Naturalists. The society chose William C. Redfield as their first president because he had proposed the most comprehensive plans for the organization. According to the first constitution [1] which was agreed to at the September 20th meeting, the goal of the society was to promote scientific dialogue in order to allow for greater scientific collaboration. By doing so the association aimed use resources to conduct science with increased efficiency and allow for scientific progress at a greater rate. The association also sought to increase the resources available to the scientific community through active advocacy of science.

There were only 87 members when the AAAS was formed. As a member of the new scientific body, Matthew Fontaine Maury, USN was one of those who attended the first 1848 meeting.

At a meeting held on Friday afternoon, September 22, 1848, Redfield presided, and Matthew Fontaine Maury gave a full scientific report on his Wind and Current Charts. Maury stated that hundreds of ship navigators were now sending to the United States Naval Observatory abstract logs of their voyages. With pride he added, Never before was such a corps of observers known. But, he pointed out to his fellow scientists, his critical need was for more "simultaneous observations."

"The work," Maury stated, "is not exclusively for the benefit of any nation or age." The minutes of the A.A.A.S. meeting reveal that because of the universality of this "view on the subject, it was suggested whether the states of Christendom might not be induced to cooperate with their Navies in the undertaking; at least so far as to cause abstracts of their log-books and sea journals to be furnished to Matthew F. Maury, USN, at the Naval Observatory at Washington."

William Barton Rogers, professor at the University of Virginia and later founder of the Massachusetts Institute of Technology, offered a resolution: "Resolved that a Committee of five be appointed to address a memorial to the Secretary of the Navy, requesting his further aid in procuring for Matthew Maury the use of the observations of European and other foreign navigators, for the extension and perfecting of his charts of winds and currents." The resolution was adopted and, in addition to Rogers, the following members of the Association were appointed to the committee, Professor Joseph Henry of Washington, Professor Benjamin Peirce of Cambridge, Massachusetts, Professor James H. Coffin of Easton, Pennsylvania, Professor Stephen Alexander of Princeton, New Jersey. This was scientific cooperation, and Maury went back to Washington with great hopes for the future.

By 1860 membership increased to over 2000. But the course of American history, however, intervened to prevent the continued growth of the AAAS. The AAAS became dormant during the American Civil War after their August 1861 meeting in Nashville, Tennessee was postponed indefinitely just after the outbreak of the first major engagement of the war at Bull Run. The AAAS was not, however, to become a casualty of the war. In 1866, Frederick Barnard presided over the first meeting of the resurrected AAAS at a meeting in New York.

Following the reformation of the AAAS, the group once again experienced a period of growth. The growth, however, was not unlimited as peace brought with it the expansion of other scientific-oriented groups. The AAAS's focus on the unification of many fields of science under a single organization still yielded some novelty. A large subset of all new science organizations that were founded to promote a single discipline. For example, American Chemical Society, founded in 1876, promotes chemistry. The National Academy of Sciences (NAS) was, however, founded by the United States Congress in 1863 which provided an alternative multidisciplinary sciences organization. Unlike the NAS, which elects members, the AAAS permitted all people regardless of scientific credentials to join. The AAAS did, however, institute a policy of granting the title of "Fellow of the AAAS" to well-respected scientists within the organization.

10 American Institute of Physics

The American Institute of Physics (AIP) is an international body representing physicists and publishing physics related journals. It was founded in 1931.

AIP is a not-for-profit membership corporation created for the purpose of promoting the advancement and diffusion of the knowledge of physics and its application to human welfare. It is the mission of the Institute to serve the sciences of physics and astronomy by serving its member societies, by serving individual scientists, and by serving students and the general public.

As a "society of societies," AIP supports ten Member Societies and provides a spectrum of services and programs devoted to advancing the science and profession of physics. A pioneer in digital publishing, AIP is also one of the world's largest publishers of physics journals and produces the publications of more than 25 scientific and engineering societies through its New York-based publishing division.

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Member Societies:

American Physical Society
Optical Society of America
Acoustical Society of America
The Society of Rheology
American Association of Physics Teachers
American Crystallographic Association
American Astronomical Society
American Association of Physicists in Medicine
American Vacuum Society: Science & Technology of Materials, Interfaces, and Processing
American Geophysical Union
Society of Physics Students
Sigma Pi Sigma: National Physics Honor Society

Affiliated Societies:

American Association for the Advancement of Science Section on Physics
American Chemical Society, Division of Physical Chemistry
American Institute of Aeronautics and Astronautics
American Meteorological Society
American Nuclear Society
American Society of Civil Engineers
ASM International: The Materials Information Society
Astronomical Society of the Pacific
Biomedical Engineering Society
Council on Undergraduate Research, Physics & Astronomy Division
The Electrochemical Society
Geological Society of America
IEEE Nuclear & Plasma Sciences Society
International Association of Mathematical Physics
International Union of Crystallography
JCPDS: The International Centre for Diffraction Data
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Laser Institute of America
Materials Research Society
Microscopy Society of America
The National Society of Black Physicists
The Polymer Processing Society
Society for Applied Spectroscopy
SPIE: The International Society for Optical Engineering

11 American Physical Society

The American Physical Society was founded in 1899 and is the world's second largest organization of physicists, behind the Deutsche Physikalische Gesellschaft. The Society publishes more than a dozen science journals, including the world renowned Physical Review and Physical Review Letters, and organizes more than twenty science meetings each year. Over 40,000 members belong to the Society.

The American Physical Society was founded on May 20, 1899, when thirty-six physicists gathered at Columbia University for that purpose. They proclaimed the mission of the new Society to be "to advance and diffuse the knowledge of physics", and in one way or another the APS has been at that task ever since. In the early years, virtually the sole activity of the APS was to hold scientific meetings, initially four per year. In 1913, the APS took over the operation of the Physical Review, which had been founded in 1893 at Cornell University, and journal publication became its second major activity. The Physical Review was followed by Reviews of Modern Physics in 1929 and by Physical Review Letters in 1958. Over the years, Phys. Rev. has subdivided into five separate sections as the fields of physics proliferated and the number of submissions grew.

In more recent years, the activities of the Society have broadened considerably. Stimulated by the increase in Federal funding in the period after the Second World War, and even more by the increased public involvement of scientists in the 1960s, the APS is active in public and governmental affairs, and in the international physics community. In addition, the Society conducts extensive programs in education, science outreach, and media relations. The APS has fourteen divisions and nine topical groups covering all areas of physics research. There are six forums that reflect the interest of its 43,000 members in broader issues, and eight sections organized by geographical region.

In 1999, the APS celebrated its Centennial with the biggest-ever physics meeting in Atlanta. In 2005 the APS took the lead role in United States participation in the World Year of Physics, initiating several programs to broadly publicize physics during the 100th anniversary of Albert Einstein's annus mirabilis. Einstein@Home, one of the projects the APS initiated during World Year of Physics, is an ongoing and popular distributed computing project.

12 Deutsche Physikalische Gesellschaft

The Deutsche Physikalische Gesellschaft (DPG, German Physical Society) is the world's largest organization of physicists. The DPG's worldwide membership is cited as 52,000, as of 2007. It holds an annual conference (Jahrestagung) and multiple spring conferences (Frhjahrstagungen), which are held at various locations and along topical subjects of given sections of the DPG

The DPG was founded in 1899 to succeed the Physikalische Gesellschaft zu Berlin (Physical Society of Berlin) established 14 January 1845. The six scientists who founded the Physical Society of Berlin were: Gustav Karsten (1820-1900, physicist), Wilhelm Heinrich Heintz (1817-1880, chemist), Karl-Hermann Knoblauch (1820-1895, physicist), Ernst Wilhelm von Brcke (1819-1892, physiologist), Emil du Bois-Reymond (1818-1896, physiologist), and Wilhelm von Beetz (1822-1886, physicist).[3] While only three of them were physicists, they were all under 28 years old and students of the physicist Heinrich Gustav Magnus. The purpose of starting the Society was to set themselves apart from the authorities and allow unfettered discussion away from the well-trodden paths.[

Presidents: With emphasis on the periods of the rise of theoretical physics and quantum mechanics in Germany (1900 to 1933) and the rule of the National Socialists (1933-1945), the Presidents of the DPG have included:[20] [21]

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1899-1905  Emil Warburg
1905-1906  Max Planck
1906  Paul Drude
1906-1907  Max Planck
1907-1908  Heinrich Rubens
1908-1909  Max Planck
1909-1910  Heinrich Rubens
1910-1912  Ferdinand Kurlbaum
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1912-1914  Heinrich Rubens
1914-1915  Fritz Haber
1915-1916  Max Planck
1916-1918  Albert Einstein [22]
1918-1919  Max Wien
1919-1920  Arnold Sommerfeld [23] [24]
1920-1922  Max Wien
1922-1924  F. Himstedt
1924-1925  Max Wien
1925-1927  Friedrich Paschen
1927-1929  H. Konen
1929-1931  Egon von Schweidler
1931-1933  Max von Laue
1933-1935  Karl Mey
1935-1937  Jonathan Zenneck
1937-1939  Peter Debye
1939-1940  Jonathan Zenneck
1940-1945  Carl Ramsauer
1956-1957  Walter Gerlach [25]
1966-1967  Wolfgang Finkelnburg [26]
1964-1965  Friedrich Bopp
1978-1979  Heinrich Welker
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[edit] Publications Publications of the DPG have included:[27] [28]

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Berichte der Deutschen physikalischen Gesellschaft
Verhandlungen der Deutschen physikalischen Gesellschaft
Physikalische Bltter
Fortschritte der Physik
Zeitschrift fr Physik, which was first published in 1920 and was the
vehicle used by those with avant-garde views and the young generation of quantum physicists in the 1920s.[29]
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13 American Society of Mechanical Engineers

The American Society of Mechanical Engineers (ASME) is a professional body, specifically an engineering society, focused on mechanical engineering. The ASME was founded in 1880 by Alexander Lyman Holley, Henry Rossiter Worthington, John Edison Sweet and Matthias N. Forney in response to numerous steam boiler pressure vessel failures. The organization is known for setting codes and standards for mechanical devices. The ASME conducts one of the world's largest technical publishing operations through its ASME Press, holds numerous technical conferences and hundreds of professional development courses each year, and sponsors numerous outreach and educational programs.

14 ASM International (American Society for Metals)

ASM International, formerly known as the American Society for Metals, is a professional organization for materials scientists and engineers working with metals.

ASM provides several information resources, including standards and the ASM Handbooks, a series of reference books that provide data on various types of metals. These handbooks are recognized as a standard reference in the field of materials science. Examples of topics covered by the ASM handbooks are mechanical properties of metals, corrosion studies, and much more. Other publications include the Handbook of Binary Alloy Phase Diagrams (ISBN 0-87170-403-X) and the Handbook of Ternary Alloy Phase Diagrams (ISBN 0-87170-525-7), both comprehensive indexes of where alloy phase diagrams can be found in the literature. ASM also hosts numerous conferences.

ASM also operates several "Materials Camps" in the summers for high school students and teachers. These camps are intended to educate the public about the materials field.

ASM has been in existence since 1913. In 1947, its 21,000 members made it the third largest scientific/technological society in the world.[3]

Early Days: At the turn of the 20th century, steel treating remains (with the exception of steel mills and a few scattered laboratories) in the hands of blacksmiths. These craftsmen work under a veil of secrecy and mystery. Trade secrets are handed down from father to son. Trusted employees are sworn to secrecy. With the advent of the automobile industry, the cloud of mystery begins to clear. Craftsmen begin to exchange information and knowledgenot freely, but to a greater degree than before. Trained as a blacksmith, William Park Woodside plies his trade in several Canadian provinces and in Pennsylvania. He begins working for the Cadillac Motor Car Company in Detroit in 1905. In his work and his travels, Woodside notes a genuine need for the exchange of technical information. He has a solution to bring heat treaters together. On Saturday, Oct. 4, 1913, Woodside invites 18 of his fellow heat treaters and automotive employees to a meeting at the Old Fellowcraft Club in Detroit. This successful meeting results in the formation of The Steel Treaters Club.

Detroit vs. Chicago: During World War I, the Steel Treaters Club becomes the Steel Treating Research Society. Sections in Chicago and Cleveland are formed. By 1918, membership totals 1,250. Difficulties develop between the Detroit and Chicago groups. After World War I, the 200 members of the Chicago group secede and form the American Steel Treaters Society. They hire a young school superintendent named William Hunt Eisenman as business manager. Eisenman embarks upon his most important mission: the establishment of chapters. Traveling from city to city, he invites influential steelmakers and steel users to a dinner and introduces the aims of the society. He is so persuasive that by the end of the evening, a chapter is often formed with officers already in place. By 1919, the combined membership of the two groups grows to 2,750 with 27 chapters. But the two groups are now establishing competing chapters in various cities.

Compromises: The rivalry between Detroit and Chicago impairs the development of both organizations. A mediator is needed to begin talks toward a reunification of the two societies. This critical role is filled by Col. Albert E. White of U.S. Army Ordnance, who would later become an associate professor of metallurgy at the University of Michigan. He urges the two opposing factions of heat treaters to negotiate their differences. Reunification is celebrated at the societys first official meeting in Philadelphia in September 1920. Elements of the names of both societies are included in a new name: American Society for Steel Treating (ASST). Both Detroit and Chicago want the national headquarters to be located in their cities, but a compromise is reached: Cleveland. Exactly one year before reunification, the Chicago groupin conjunction with their first conventioninitiates something that no organization in America had tried before: a concurrent exposition of heat treating equipment and products. The first Metal Show is a resounding success. The second Metal Show is held in Philadelphia in September 1920 as a feature of the first convention of the now-united ASST. This highly successful event will be held annually for the next 53 years.

15 Society of Automotive Engineers

SAE International (SAE) is a professional organization for mobility engineering professionals in the aerospace, automotive, and commercial vehicle industries. The Society is a standards development organization for the engi-

neering of powered vehicles of all kinds, including cars, trucks, boats, aircraft, and others. Membership is open to the public for those particularly interested in Human Factors and Ergonomic Standards.

History In the early 1900's there were dozens of automobile manufacturers in the United States. Many of these manufacturers joined trade groups that allowed them to promote the industry and raise public awareness related to the automobile. A need for patent protection and the development of engineering standards emerged during this time.

Two magazine men of the era: Peter Heldt of The Horseless Age, and Horace Swetland of The Automobile advocated the creation of SAE. Heldt wrote an editorial in June of 1902 in which he said, "Now there is a noticeable tendency for automobile manufacturers to follow certain accepted lines of construction, technical questions constantly arise which seek solution from the cooperation of the technical men connected with the industry. These questions could best be dealt with by a technical society. The field of activity for this society would be the purely technical side of automobiles." Likewise, Swetland used his editorial power to drum up support for the creation of an organization like SAE. Swetland went on to become one of the founding officers in the organization.

Starting out as the Society of Automobile Engineers in 1905, SAE's original purpose was to promote the use of standards in the nascent automobile industry (initially in the United States) and to promote the better interchange of ideas and expertise, in a similar manner to many other technical societies.

Although beginnings were modest with only 30 inaugural members (Andrew L. Riker was the inaugural president, and Henry Ford the inaugural vice-president), SAE's numbers grew steadily. Membership reached approximately 1800 by 1916, at which point the society expanded its mission to cover all forms of self-powered transport, including aircraft, boats, agricultural machinery, and others. The new word automotive (from Greek for autos, meaning "self" and motivus, meaning "of motion") was coined by the Society to describe all self-powered vehicles, and the name was changed. Other notable supporters of the new organization included Thomas Edison, Glenn Curtiss, Glenn Martin, and Orville Wright.

Charles Kettering presided over SAE during World War I and saw membership pass the 5,000 mark. During this time, SAE emphasized the importance of developing member activity through local chapters - called Sections.

After World War II, the Society established links with other standards bodies and automotive engineering societies worldwide, and since then has founded sections in a number of countries formerly lacking such organizations, including: Brasil, India, China, Russia, Romania, and Egypt.

By 1980 membership had grown to 35,000+. And today more than a quarter of the Society's membership today is from outside of North America.

16 National Science Foundation

The National Science Foundation (NSF) is a United States government agency that supports fundamental research and education in all the non-medical fields of science and engineering. Its medical counterpart is the National Institutes of Health. With an annual budget of about 6.02 billion (fiscal year 2008), NSF funds approximately 20 percent of all federally supported basic research conducted by the United States' colleges and universities. In some fields, such as mathematics, computer science, economics and the social sciences, NSF is the major source of federal backing.

The NSF's director, its deputy director, and the 24 members of the National Science Board (NSB)[1] are appointed by the President of the United States, and confirmed by the United States Senate. The director and deputy director are responsible for administration, planning, budgeting and day-to-day operations of the foundation, while the NSB meets six times a year to establish its overall policies. The current NSF director is Dr. Arden L. Bement, Jr., and the current deputy director is Dr. Kathie L. Olsen.

The NSF was established by the National Science Foundation Act of 1950. Its stated mission:

To promote the progress of science; to advance the national health, prosperity, and welfare; and to secure the national defense. Some historians of science have argued that the result was an unsatisfactory compromise between too many clashing visions of the purpose and scope of the federal government.[6] NSF was certainly not the primary government agency for the funding of basic science, as its supporters had originally envisioned in the aftermath of World War II. By 1950, support for major areas of research had already become dominated by specialized agencies such as the National Institutes of Health (medical research) and the U.S. Atomic Energy Commission (nuclear and particle physics). That pattern would continue after

1957, when U.S. anxiety over the launch of Sputnik led to the creation of the National Aeronautics and Space Administration (space science) and the Defense Advanced Research Projects Agency (defense-related research).

Nonetheless, NSF's scope has expanded over the years to include many areas that were not in its initial portfolio, including the social and behavioral sciences, engineering, and science and mathematics education. Today, as described in its 20032008 strategic plan, NSF is the only U. S. federal agency with a mandate to support all the non-medical fields of research.

In the process, moreover, the foundation has come to enjoy strong bipartisan support from Congress. Especially after the technology boom of the 1980s, both sides of the aisle have generally embraced the notion that government-funded basic research is essential for the nation's economic health and global competitiveness, as well as for the national defense. That support has manifested itself in an expanding budgetfrom 1 billion in 1983 to just over 6.02 billion by FY 2008. (fiscal year 2007).

Timeline Pre-World War II Academic research in science and engineering is not considered a federal responsibility; almost all support comes from private contributions and charitable foundations.

World War II There is a growing awareness that America's military capability owes a great deal to the nation's strength in science and engineering. Congress considers several proposals to provide federal support for research in these fields.

1945 Vannevar Bush, head of the government's wartime Office of Scientific Research and Development, issues a report to President Harry S. Truman, entitled ScienceThe Endless Frontier. The report lays out a strong case for having the federal government fund scientific research, arguing that the nation would reap rich dividends in the form of better health care, a more vigorous economy, and a stronger national defense. The report also proposes creating a new federal agency, the "National Research Foundation," to administer this effort.

19451950 Although there is broad agreement in Washington with the principle of federal support for science, there is far less agreement on exactly how that effort should be organized and managed. Thrashing out a consensus requires five years of negotiation and compromise.

1950 On May 10, President Truman signs Public Law 507, creating the National Science Foundation. The act provides for a National Science Board of twenty-four part-time members and a director as chief executive officer,

all appointed by the president.

1951 In early March, Truman nominates Alan T. Waterman, the chief scientist at the Office of Naval Research, to become the first Director of the fledgling agency. With the Korean War underway, money is tight: the agency's initial budget is just 151,000.

1952 After moving its administrative offices twice, NSF begins its first full year of operations with an appropriation from Congress of just 3.5 million, a figure far less the almost 33.5 million requested. Twenty-eight research grants are awarded.

1957 On October 5, the Soviet Union orbits Sputnik 1, the first ever man-made satellite. The successful rocket launch forces a national self-appraisal that questions American education, scientific, technical and industrial strength. For 1959, Congress increases the NSF appropriation to 134 million, nearly 100 million higher than the year before. By 1968, the NSF budget will stand at nearly 500 million.

1958 NSF selects Kitt Peak, near Tucson, Arizona, as the site of the first national observatory, a research center that would make state-of-the-art telescopes available to every astronomer in the nation. (Prior to this time, there was no equal access; major research telescopes were privately funded, and were available only to the astronomers who taught at the universities that ran them.) Today, that idea has expanded to encompass the National Optical Astronomy Observatory, the National Radio Astronomy Observatory, the National Solar Observatory, the Gemini Observatory and the Arecibo Observatory, all of which are funded in whole or in part by NSF. Along the way, moreover, NSF's astronomy program has forged a close working relationship with that of NASA, which was also founded in 1958: just as NASA has responsibility for the U. S. effort in space-based astronomy, NSF provides virtually all the U. S. federal support for ground-based astronomy.

1959 The United States and other nations operating in Antarctica conclude a treaty that reserves the continent for peaceful and scientific research. Shortly thereafter, a presidential directive based on the treaty gives NSF the responsibility for virtually all U.S. operations and research on the continent; the U.S. Antarctic Program continues to this day.

1960 Emphasis on international scientific and technological competition further accelerates NSF growth. The Foundation starts the Institutional Support Program, a capital funding program designed to build a research infrastructure among American universities; it will be the single largest ben-

eficiary of NSF budget growth in the 1960s. NSF's appropriation is 152.7 million; 2,000 grants are made.

1968 The Deep Sea Drilling Project begins. Over the years, the project reveals much new evidence about the theories of continental drift, sea floor spreading and the general usefulness of the ocean basins. The program also becomes a model of international cooperation as several foreign countries join the operation.

1972 NSF takes over management of twelve interdisciplinary materials research laboratories from the Defense Department's Advanced Research Projects Agency (DARPA). These university-based laboratories had taken a more integrated approach than did most academic departments at the time, encouraging physicists, chemists, engineers, and metallurgists to cross departmental boundaries and use systems approaches to attack complex problems of materials synthesis or processing. NSF begins to expand these laboratories into a nationwide network of Materials Research Science and Engineering Centers. 1972 : NSF launched the biennial Science and Engineering Indicators report to the President of the United States and U.S. Congress. Founded in 1968 as a research institution in bibliometrics and patent analytics ipIQ dba The Patent Board has provided patent indicators and science literature analysis since the intitial report in 1972.

1977 The first "Internet" is developed. This interconnection of unrelated networks is run by DARPA. Over the next decade, increasing NSF involvement leads to a three-tiered system of internetworks managed by a mix of universities, nonprofit organizations and government agencies. By the mid-1980s, primary financial support for the growing project is assumed by the NSF.[8]

1983 The agency budget tops 1 billion for the first time. Major increases in the nation's research budget are proposed as the country recognizes the importance of research in science and technology, as well as education. A separate appropriation is established for the U.S. Antarctic Program. NSF receives more than 27,000 proposals and funds more than 12,000 of them.

1985 In November NSF delivers ozone sensors, along with balloons and helium, to researchers at the South Pole so they can measure stratospheric ozone loss. The action is taken in response to findings made in May of that year, indicating a steep drop in ozone over a period of several years. The Internet project, now known as NSFNET, continues.

1990 NSF's appropriation passes 2 billion for the first time.

1990s NSF funds the development of several curricula based on the NCTM standards, devised by the National Council of Teachers of Mathematics. These standards are widely adopted by school districts during the subsequent decade. However, in what newspapers such as the Wall Street Journal later call the "math wars", organizations such as Mathematically Correct complain that some elementary texts based on the standards, including Mathland, have almost entirely abandoned any instruction of traditional arithmetic in favor of cutting, coloring, pasting, and writing. During that debate, NSF is both lauded and criticized for favoring the standards.

1991 In March, the NSFNET acceptable use policy is altered to allow commercial traffic. By 1995, with the private, commercial market thriving, NSF decommissions the NSFNET, allowing for public use of the Internet.

1993 Students and staff working at the NSF-supported National Center for Supercomputing Applications (NCSA) at the University of Illinois, Urbana-Champaign, develop Mosaic, the first freely available browser to allow World Wide Web pages that include both graphics and text. Within 18 months, NCSA Mosaic becomes the Web browser of choice for more than a million users, and sets off an exponential growth in the number of Web users.

1994 NSF, together with NASA and DARPA, launches the Digital Library Initiative. One of the first six grants goes to Stanford University, where two graduate students, Larry Page and Sergey Brin, begin to develop a search engine that uses the links between Web pages as a ranking method. They will later commercialize their search engine under the name Google.

1996 NSF-funded research establishes beyond doubt that the chemistry of the atmosphere above Antarctica is grossly abnormal and that levels of key chlorine compounds are greatly elevated. During two months of intense work, NSF researchers learn most of what we know today about the ozone hole.

1998 Two independent teams of NSF-supported astronomers discover that the expansion of the universe is actually speeding up, as if some previously unknown force, now known as dark energy, is driving the galaxies apart at an ever increasing rate.

2000 NSF joins with other federal agencies in the National Nanotechnology Initiative, dedicated to the understanding and control of matter at the atomic and molecular scale. Today, NSF's roughly 300 million annual investment in nanotechnology research is still one of the largest in the 23-agency initiative.

2001 NSF's appropriation passes 4 billion. The NSF's Survey of Public Attitudes Toward and Understanding of Science and Technology reveals that the public has a positive attitude toward science but a poor understanding of it.

20045 NSF sends "rapid response" research teams to investigate the aftermath of the Indian Ocean Tsunami and Hurricane Katrina. An NSF-funded engineering team helps uncover why the levees failed in New Orleans.

2005 NSF's budget stands at just over 5.6 billion.

2006 NSF's budget stands at 5.91 billion for the 2007 fiscal year that began on October 1, 2006 and runs through September 30, 2007.

2007 NSF requests 6.43 billion dollars for FY 2008. (NSF Budgets

17 National Institutes of Health

The National Institutes of Health (NIH) is an agency of the United States Department of Health and Human Services and is the primary agency of the United States government responsible for biomedical and health-related research.

As of 2003, the Institutes are responsible for 28

The predecessor of the NIH began in 1887 as the Laboratory of Hygiene. It grew and was reorganized in 1930 by the Ransdell Act into the National Institute of Health (singular at the time). Today it is one of the world's foremost medical research centers, and the Federal focal point for medical research in the U.S. The NIH, comprising 27 separate institutes, centers and the Office of the Director, is part of the United States Department of Health and Human Services. The current NIH Director is Elias Zerhouni.

The goal of NIH research is to acquire new knowledge to help prevent, detect, diagnose, and treat disease and disability, from the rarest genetic disorder to the common cold. The NIH mission is to uncover new knowledge that will lead to better health for everyone. NIH works toward that mission by: conducting research in its own laboratories; supporting the research of non-Federal scientists in universities, medical schools, hospitals, and research institutions throughout the country and abroad; helping in the training of research investigators; and fostering communication of medical and health sciences information.

A Short History of the National Institutes of Health

The NIH traces its roots to 1887, when a one-room laboratory was created within the Marine Hospital Service (MHS), predecessor agency to the U.S. Public Health Service (PHS). The MHS had been established in 1798 to provide for the medical care of merchant seamen. One clerk in the Treasury Department collected twenty cents per month from the wages of each seaman to cover costs at a series of contract hospitals. In the 1880s, the MHS had been charged by Congress with examining passengers on arriving ships for clinical signs of infectious diseases, especially for the dreaded diseases cholera and yellow fever, in order to prevent epidemics. During the 1870s and 1880s, moreover, scientists in Europe presented compelling evidence that microscopic organisms were the causes of several infectious diseases. In 1884, for example, Koch described a comma-shaped bacterium as the cause of cholera.

Officials of the MHS followed these developments with great interest. In 1887, they authorized Joseph J. Kinyoun, a young MHS physician trained in the new bacteriological methods, to set up a one-room laboratory in the Marine Hospital at Stapleton, Staten Island, New York. Kinyoun called this facility a "laboratory of hygiene" in imitation of German facilities and to indicate that the laboratory's purpose was to serve the public's health. Within a few months, Kinyoun had identified the cholera bacillus in suspicious cases and used his Zeiss microscope to demonstrate it to his colleagues as confirmation of their clinical diagnoses. "As the symptoms . . . were by no means well defined," he wrote, "the examinations were confirmatory evidence of the value of bacteria cultivation as a means of positive diagnosis." For another photo of Dr. Kinyoun, see the NIH Almanac

In 1891, the Hygienic Laboratory, as it came to be called, was moved to Washington, D.C., near the U.S. Capitol. For the next decade, Kinyoun remained the sole full-time staff member. He inaugurated a training program in bacteriology for MHS officers and conducted numerous tests of water purity and air pollution for the District of Columbia and the Congress. In 1901, the laboratory was belatedly recognized in law when Congress authorized 35,000 for construction of a new building in which the laboratory could investigate "infectious and contagious diseases and matters pertaining to the public health." Occupied in 1904, this building was located at 25th and E Streets, N.W., in Washington, D.C. The founding legislation for the NIH, therefore, resides in a routine supplemental appropriations act. Many other scientific agencies of the federal government were also created via "money bills." Congress was not convinced that such bureaucracies would

prove demonstratively useful, so it chose to preserve the option of divesting the government of them simply by not renewing their funding.

In 1902 two acts contributed significantly to the emergence of the Hygienic Laboratory as a center for research within the federal government. The first reorganized the MHS and renamed it the Public Health and Marine Hospital Service (PH-MHS), moving it toward its status as the chief U.S. public health agency. More importantly for the Hygienic Laboratory, the act launched a formal program of research by designating the pathological and bacteriological work as the Division of Pathology and Bacteriology and by creating three new components that represented the most fruitful areas for research at that time: the Divisions of Chemistry, Pharmacology, and Zoology. The importance of these new programs was underscored by the provision that the PH-MHS could hire Ph.D. specialists to head them. Before this, the professional staff had been limited to physicians.

During World War I, the Public Health Service attended primarily to sanitation of areas around military bases in the U.S. The staff of the Hygienic Laboratory traced the cause of anthrax outbreaks among the troops to contaminated shaving brushes and discovered that the bunion pads widely used to cover smallpox vaccinations could harbor tetanus spores. In 1916, the director of the laboratory, Dr. George McCoy , hired the laboratory's first female bacteriologist, Dr. Ida Bengtson. When the 1918 influenza pandemic struck Washington, physicians from the laboratory were pressed into service treating patients in the District of Columbia because so many local doctors fell ill.

In 1930, the Ransdell Act changed the name of the Hygienic Laboratory to National Institute (singular) of Health (NIH) and authorized the establishment of fellowships for research into basic biological and medical problems. The roots of this act extended to 1918, when chemists who had worked with the Chemical Warfare Service in World War I sought to establish an institute in the private sector to apply fundamental knowledge in chemistry to problems of medicine. In 1926, after no philanthropic patron could be found to endow such an institute, the proponents joined with Louisiana Senator Joseph E. Ransdell to seek federal sponsorship. The truncated form in which the bill was finally enacted in 1930 reflected the harsh economic realities imposed by the Great Depression. Nonetheless, this legislation marked a change in the attitude of the U.S. scientific community toward public funding of medical research.

For more history see ttp://history.nih.gov/exhibits/history/index.html

18 Office of Naval Research

The U.S. Office of Naval Research (ONR), headquartered in Arlington, Virginia (Ballston), is the office within the U.S. Department of the Navy that coordinates, executes, and promotes the science and technology programs of the U.S. Navy and Marine Corps through schools, universities, government laboratories, and nonprofit and for-profit organizations.

ONR was authorized by an Act of Congress, and subsequently approved by President Harry S. Truman on August 1, 1946, with the stated mission of "planning, fostering, and encouraging scientific research in recognition of its paramount importance as related to the maintenance of future naval power and the preservation of national security."

19 ASTM International

ASTM International (ASTM), originally known as the American Society for Testing and Materials, is an international standards organization that develops and publishes voluntary consensus technical standards for a wide range of materials, products, systems, and services. The organization's headquarters is in West Conshohocken, Pennsylvania, about 5 miles northwest of Philadelphia.

ASTM predates other standards organizations such as BSI (1901), DIN (1917) and AFNOR (1926), but differs from these in that it is not a national standards body, that role being taken in the USA by ANSI. However, ASTM has a dominant role among standards developers in the USA, and claims to be the world's largest developer of standards. Using a consensus process, ASTM supports thousands of volunteer technical committees, which draw their members from around the world and collectively develop and maintain more than 12,000 standards.

ASTM International publishes the Annual Book of ASTM Standards each year in print, CD and online versions. The online version was available by subscription and cost was based upon usage. For 2008, the complete set of books or CDs cost almost USD 9000 dollars and included 81 volumes.

History A group of scientists and engineers, led by Charles Benjamin Dudley formed the American Society for Testing and Materials in 1898 to address the frequent rail breaks plaguing the fast-growing railroad industry. The group developed a standard for the steel used to fabricate rails.

The organization celebrated its Centennial in 1998 with an examination of the group's mission and discussion about their relevence in today's global environment.