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Scholarly Communication in the Sciences, from Tycho Brahe to the CDC

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**Scholarly
Communication in
the Sciences,
from Tycho Brahe to
the CDC**

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This group of documents focuses on 400 years of scholarly communication, showing how scientists have used print culture to document their activities, disseminate information, and share discoveries. The increasing professionalization of science is evidenced in examples of publishing from the early 16th century to the present day. In the late medieval and early modern periods, science and the dissemination of scientific research was generally an informal, gentlemanly pursuit. In the 18th and 19th centuries, it changed into an increasingly rigorous and organized practice, with growing standards for verification, inclusion, and publication. Also notable at this time are publications showing the increased role of the state in sponsoring scientific research and dissemination, from the 19th century to the present.

Early Science

Michael Vratislaviensis, d. 1534. *Introductoria Astronomie Cracoviense Elcidas Almanach*. Cracow, 1506.

– This almanac was one of the first books printed in Cracow. Annual sets of astronomical tables, in almanac form, are some of the earliest periodicals, and one of the first type of items printed whenever the first printing press reached a new town.

Hieronymus Brunschwig, ca. 1450–ca. 1512. *The Vertuose Boke of Distyllacyon of the Waters of All Manere of Herbes, With the Figures of the Syllatoryes....* London: Laurens Andrewe, 1527.

– An early English translation from the original German, this book provided a set of instructions for preparing herbal extracts and infusions. The translating and dissemination of authoritative reference works like this took place almost immediately after the spread of printing in Europe in the late fifteenth century.

Tycho Brahe, 1546-1601. *Tychonis Brahe Dani Epistolarum Astronomicarum Libri*. Uraniburg: Tycho Brahe, 1596.

– Tycho was a Danish nobleman who built a private observatory on his estate. He independently issued his own extremely accurate astronomical measurements throughout the European scientific world. For the last

two years of his life, he was assisted by Johannes Kepler, whose theories of planetary motion are directly influenced by Brahe.

Theodor de Bry, 1528-1598. *Admiranda Narratio, Fida Tamen, de Commodia et Incolarum Ritibus Virginiae....* Frankfurt: Sigismundi Feirabendii, 1590.
– John White accompanied Sir Walter Raleigh to Virginia in 1585-86 and produced a series of watercolors based on his observations. His works were the basis of many sets of engravings of Virginia, most notably Theodor de Bry's "Greater Voyages," a comprehensive collection of New World accounts that appeared in several parts in the 1590s.

Early Modern Science

Richard Wiseman, 1622?-1676. *Severall Chirurgicall Treatises*. London: Flesher and Maycock for Royston and Took, 1676. *Gift of Warren A. Darby*.

– Wiseman, the father of English surgery, was the first physician to advocate primary amputation (i.e. before the onset of gangrene). In his introduction to this collection of case histories, he thanks his predecessors, entreats his younger colleagues to take time from their practice for reflection and con-templation, and encourages his colleagues to dialogue with each other on complicated cases and to share case notes to improve their mutual practices.

The Philosophical Transactions of the Royal Society of London. Volume 1. 1665 to 1672, abridged. London: C. and R. Baldwin, 1809.

– The Royal Society's *Philosophical Transactions* is the world's oldest continually-published scientific journal. Established after the Restoration, it reprinted papers read at society meetings and included foreign reports and correspondence and book reviews. The accompanying 1801 volume was the first volume purchased for the University Libraries, which has now subscribed continuously to it for over 200 years.

Giambattista della Porta, 1535?-1615. *Natural Magick...Wherein Are Set Forth All the Riches and Delights of the Natural Sciences*. London: Thomas Young and Samuel Speed, 1658.

– This book, an English reprint of a 1558 Italian work, shows how the late medieval scientific community retained a large sense of wonder at the natural world. Individual disciplines in the sciences have not yet broken down into specialties; astrology and alchemy are all part of observational and experimental science.

Fruits of Enlightenment

Denis Diderot, 1713-1784, and Jean Le Rond d'Alembert, 1717-1783, eds. *Encyclopédie, ou Dictionnaire Raisonné des Sciences, des Arts et des Métiers....* Paris: Briasson, 1751-77.

– Published in 21 text volumes, 8 volumes of illustrative plates and a 2-volume index, the *Encyclopédie* was the largest compilation of recorded knowledge to date. Containing essays on the state of the natural and physical sciences, trades, industrial practices, exploration, and geography, it was originally charged to update an earlier English work. The project grew, despite official censorship, into an effort to collect and dissemble all the new information, discoveries, and ideas taking hold in the eighteenth century European “republic of letters.”

Benjamin Franklin, 1706-1790. “Description of a New Stove for Burning of Pitcoal, and Confuming All Its Smoke.” *Transactions of the American Philosophical Society, Volume II*. Philadelphia: Robert Aitken, 1786.

– Like the Royal Society, the American Philosophical Society was formed to allow its members a forum to share observation and discovery. The *Transactions* was produced as an annual volume. Its large format, wide margins, and fold-out engravings were extremely elaborate for a printed book in the new republic.

State-sponsored Scientific Research

United States Surgeon General's Office. *The Medical and Surgical History of the War of the Rebellion*. Washington: Government Printing Office, 1870-1888.

– Throughout history, warfare has been a catalyst for medical advances, especially in surgery, and one volume of this set provides detailed, illustrated case histories of surgical techniques (including early plastic surgery) used in battle and afterward.

William Phipps Blake, 1826-1910. *Report of a Geological Reconnaissance of California....* New York and London: H. Belliere, 1858.

– In the wake of Lewis and Clark, the federal government sponsored several military expeditions to explore the West in order to map and survey. Increasingly, scientists were included in the groups. Geological surveys were always of primary importance for mining and railroad surveying.

Michael Tuomey, 1805-1857. *Report on the Geological and Agricultural Survey of the State of South Carolina*. Columbia: A. S. Johnston, 1844.

– This first geological survey of South Carolina was completed by Michael Tuomey, who had previously done geological work in Virginia and, after his time in South Carolina, became professor of mineralogy at the University of Alabama.

Nineteenth-century periodicals

Daniel Lee and D. Redmond, eds. *The Southern Cultivator*. Volume XII, 1854. Augusta, GA.

– One of several Southern antebellum agricultural journals, and one of hundreds of agricultural journals published in the United States in the 19th century. While not scholarly, periodicals like it disseminated articles and news to a rural audience, keeping subscribers abreast of technological developments.

Benjamin Silliman, ed. *The American Journal of Science....* Volume I, 1819.

– Newspapers and periodical publishing in America exploded over the course of the nineteenth century. Numerous independent scientific journals emerged. Some, like “Silliman’s Journal,” were edited by professors and professional scientists. By the late nineteenth century, universities would host and sponsor periodicals themselves.

The Ibis, A Quarterly Journal of Ornithology. Fifth Series, Vol. II, 1884.

– The journal of the British Ornithologists’ Union, and especially notable for its illustrations. As separate scientific disciplines codified, British and American societies for every new branch of science formed.

Twentieth-century Highlights

Albert Einstein, 1879-1955. **“Zur Elektrodynamik bewegter Körper.”** *Annalen der Physik*, Vierte Folge, Vol. 17, pt. 10, 1905.

– By the turn of the twentieth century, virtually all important scientific discoveries were now announced in scholarly journals. This is the first (“On the Electrodynamics of Moving Bodies”) of three articles Einstein would publish in the *Annalen* in 1905. This paper, Einstein’s first on special relativity, radically equated the substance of matter with energy, canceling out the Newtonian view of the world that had held for over two centuries.

James Dewey Watson, 1928- and Francis Harry Compton Crick, 1916-2004. **“Molecular Structure of Nucleic Acids. A Structure for Deoxyribose Nucleic Acid.”** *Nature* Vol. 171, No. 4356, April 25, 1953.

– This article contains the first description of DNA and the first illustration of the double helix structure, perhaps the single most important biological finding of the century, for which Watson and Crick would win the 1962 Nobel Prize in Medicine.

Alan Mathison Turing, 1912-1954. **“Computing Machinery and Intelligence.”** *Mind: A Quarterly Review of Psychology and Philosophy*, Vol. LIX, No. 236, October 1950.

– Turing’s classic article on the possibility of artificial intelligence. This paper speculates on the proposition: “Can a machine think?” and describes a test, which if met, would prove that a machine could think as a human can.

“Pneumocystis Pneumonia – Los Angeles.”

Morbidity and Mortality Weekly Report 30:250-2, June 5, 1981. Reprinted in: *AIDS Reference & Research Collection*. Frederick MD: University Publishing Group, 1986.

– This volume reprints all articles on HIV/AIDS from the Center for Disease Control’s *Morbidity and Mortality Weekly Report (MMWR)* published from 1981 to 1986. This article contains the first recorded description of several men contracting cases of pneumocystis pneumonia. The first use of the term AIDS would appear in the *MMWR* in September 1982.