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## **History of Science and History of Technology (Class Q, R, S, T, and applicable Z)**

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### **I. Scope**

This Collections Policy Statement covers all of the subclasses of Science and Technology and treats the history of all of these disciplines as taken together. In a certain sense, all of the materials in Q and T are part of the history of science and technology. The Library has extensive resources in medicine and agriculture, but many years ago a decision was made that the Library should not intensively collect materials in clinical medicine and technical agriculture, which are subject specialties of the National Library of Medicine and the National Agricultural Library. In addition, some of the numerous abstracting and indexing services, catalogs of other scientific and technical libraries, specialized bibliographies, and finding aids for the history of science and technology are maintained in class Z.

### **II. Research Strengths**

#### **1. General**

The Library's collections are extremely strong in both the history of science and the history of technology. Both collections comprise two major elements: the seminal works of science and technology, and the works of scientific and technological historiography. The former comprise the original classic works of science and technology, the "real stuff" as it was composed by the "doers" themselves. These landmark works can be viewed as the primary sources in science and technology, or as rungs in its eventually progressive ladder. Well-known examples that most would recognize are Nicolaus Copernicus' *De revolutionibus orbium coelestium* (1543), Isaac Newton's *Philosophiæ naturalis principia mathematica* (1687), and Charles Darwin's *On the origin of species* (1859).

In addition to these and many other major works, there is the far greater number of monographs that are somewhat lesser known but still of prime significance. With these must also be included long runs of virtually all the major journals of science and technology (some of which date from the seventeenth century), which contain analogous classics of science and technology but in the form of papers and articles.

Contrasted to these primary sources are secondary works which, with a traditional historical narrative, link these primary works and tell a story of scientific and technological development. These are works of analysis and interpretation that critically examine sources and synthesize their particulars into a general narrative. Any institution such as the Library of Congress that aspires to collect comprehensively in the history of science and technology must fully address both of these dimensions and seek to obtain the primary works along with their secondary counterparts. The Library addresses both of these tasks directly, and searches out retrospective primary and secondary materials in science and technology in all the major European languages as well as English. Because it has been acquiring scientific and technical material since its inception at the close of the eighteenth century, the Library's collections are very broad and deep.

The 1866 act of Congress, the "Smithsonian Deposit," that transferred to the Library from the Smithsonian Institution about 40,000 volumes of memoirs, transactions, and periodicals of learned scientific societies, museums, exploring expeditions, and observatories throughout the world, considerably broadened the science and technology collections and permanently influenced their development. Subsequent yearly deposits ran this total to over 580,000 volumes before it was merged with the general collections.

A second special circumstance was the Copyright Act of 1870. In that year it became law that "all records and other things relating to copyrights and required by law to be preserved, shall be under the control of the Librarian of Congress." According to the law, "no one could claim a copyright upon any book, map, chart... without depositing in the mail, addressed to the Librarian of Congress, two copies of the same within ten days of publication." There have been considerable emendations to the procedure since the 1870 act, including the "Copyright Best Edition" statement, but the result became the keystone of the Library of Congress as the national library of the United States. The effect on the Library's scientific and technological collections has been immense: every copyrighted book, pamphlet and periodical published in the United States has theoretically come to the Library, although in actual practice there have been difficulties in always securing compliance. In addition, the acquisition of a number of rare book collections such as Rosenwald, Thacher, Toner, and Vollbehr, contributed significantly to the Library's holdings of early scientific and technical publications and classic first editions.

## 2. Areas of distinction

The Library's collections of materials relating to the history of aeronautics and astronautics are particularly strong. Indeed, the Library arguably has the world's most extensive collections. These are fully described in *Aeronautical and Astronautical Resources of the Library of Congress: A Comprehensive Guide* (Washington, Library of Congress, 2007. 463 p.). Also of notable historical strength are the Library's collections of materials relating to psychoanalytic thought. These, which include the works and papers of Sigmund Freud and those of most of his European and American disciples, are among the finest in existence. Other collections of preeminence include those in gastronomy (Bitting and Pennell collections), natural history, botany, astronomy, technology, and chemistry. These collections are highlighted in Leonard Bruno's *The Tradition of Science: Landmarks of Western Science in the Collection of the Library of Congress* (Washington, Library of Congress, 1987. 351p.), his *The Tradition of Technology: Landmarks of Western Technology in the Collections of the Library of Congress* (Washington, Library of Congress, 1995. 356 p.), James Reveal's *Gentle Conquest: the Botanical Discovery of North America with Illustrations from the Library of Congress*

(Washington, Starwood Pub., c1992. 160 p.) and Leonard N. Beck's *Two Loaf-Givers: or a Tour through the Gastronomic libraries of Katherine Golden Bitting and Elizabeth Robins Pennell* (Washington, Library of Congress, 1984. 223 p.)

The Library's collections of rare printed works in the history of science and technology are definitely among the very strongest in the country. For example, the Library has more than 90 percent of the works listed in Bern Dibner, *Heralds of Science* (1980) and Harrison D. Horblit, *One Hundred Books Famous in Science* (1964). (Horblit's work actually describes 129 books, not 100.) When the Library was made aware in the 1990's that no single library in the world actually has *all* of the foundation classics listed in Horblit's book, the decision was made that with the financial assistance of the Madison Council and the Library's yearly appropriations, the Library of Congress would obtain copies of *all* of the exact editions of the classics included in the Horblit volume. That lofty aim is now within view.

This strength in landmark monographs is complemented by a manuscript collection of scientific and technological materials second to none in the United States. The Library's manuscript holdings include the papers of Alexander Graham Bell, Luther Burbank, Lee De Forest, John William Draper (medicine, photochemistry), Sigmund Freud, George Gamow, Asaph Hall (astronomy), William Temple Hornaday, Irving Langmuir (chemistry), Jacques Loeb, Matthew Fontaine Maury, Margaret Mead, Samuel F.B. Morse, J. Robert Oppenheimer, Glenn Seaborg, Merle Tuve (radio waves, ionosphere), Alan Waterman (radio waves), Edward O. Wilson, and the Wright Brothers, among a very great many others. Related to this is the Library's great depth of biographical materials in its general collections. This varied and substantial body of work spans a time frame of before Greece and Rome to the present day, and contains materials recording the scientific and technological accomplishments of these times.

In the area of the history of computers, data processing, storage device development, software evolution, and hardware engineering, the Library's collections are significant. It holds the works and papers of Herman Hollerith, John von Neumann, Vannevar Bush (analog computer), Claude Elwood Shannon (information theory) and John W. Backus (FORTRAN). One of the Library's strengths in the history of computer science is the fact that it holds all editions of books describing a programming language, an operating system, a storage device, not simply the most current edition and that its abstracting and indexing services, journal literature, technical reports, and electronic resources chronicle the development of computer and information science from its inception. For more detailed information on the Library's collecting policies on wireless technology, electronics, and sensor technology, see the Collections Policy Statement on Computer Science, Telecommunication, and Artificial Intelligence, the Collections Policy Statement on Technology, and the Collections Policy Statement on Science - General. These policies determine the wide-range of computer-related materials that have been and are presently being acquired to make the Library's collections among the best in the world. *A case in point: The Chip: How two Americans Invented the Microchip and Launched a Revolution* (1984) was written in its entirety in the Library's Science Reading Room.

### **III. Sources of Collection**

The Library acquires materials from a variety of sources, e.g., Copyright deposit, Cataloging in Publication (CIP), overseas offices, blanket order, purchase, gift, and exchange and in all formats, e.g., print materials, microform, electronic, and audio-visual. The Collections Policy Statement for Electronic Resources, the Collections Policy Statement for Web Capture and

Archiving, the Collections Policy Statement for Dissertations and Theses, and the “Copyright Best Edition Statement” are used in conjunction with this policy to augment the Library’s electronic collections in the history of science and the history of technology.

#### IV. General Collecting Policy

The Library acquires materials, in all periods and in all languages, at the research or comprehensive level in the history of science and the history of technology. The goal of the Library’s acquisition policy in the history of science and technology is to acquire works in all languages which treat the history of a scientific discipline or scientific thought and practice (technology) generally, and to acquire the published works of explorers, scientists, engineers and inventors of the past. The emphasis is on original texts, critical editions, scholarly commentaries, anthologies, journals, reference works, and biographies. The overall context for this policy is the Library’s position as the national library and its function as library of last resort. Acquisitions in other formats, e.g., oral histories, electronic resources, webcasts, podcasts, etc., relating to the history of science and technology are obtained in order to build on our current strengths and to expand strengths where appropriate.

The Collections Policy Statement for Electronic Resources, Selection Guidelines, the Collections Policy Statement for Web Capture and Archiving, the Collections Policy Statement for Dissertations and Theses, and the “Copyright Best Edition” statement are used in conjunction with this policy as are the statements for Medicine, Agriculture, Veterinary Science, Science - General, the Life Sciences, the Physical Sciences, Biotechnology, Technology, Chemical Sciences, Earth Sciences, Military Sciences, and Environmental Sciences, to maintain the Library’s collecting strengths in the history of science and technology. Since the history of science and technology is a broadening and increasingly interdisciplinary field, a research level collection should be maintained whose emphasis is on works in the history of major scientific and technical institutions, societies and movements, as well as on the major social consequences of science and technology.

As more publications are issued digitally, the Library must ensure that all important and appropriate information is added to the collections and that the data formats are maintained to assure continued access to the digital information. Some e-journal and born digital materials in science and technology are collected at a lower level than their print counterparts, because the current copyright law does not address the deposit of electronic materials. Also, some of the mechanics associated with the acquisition, storage and display of digital materials have not yet been resolved. As e-prints, podcasts, webcasts, and new technologies for creating scientific material proliferate and the Copyright law includes these materials as depository items, they will be collected at the same rate as their print counterparts in the history of science and technology, using the same criteria.

#### V. Collecting Levels

<u>Classes</u>	<u>Subject</u>	<u>Level</u>	<u>Comments</u>
Q124.6-125	General science history & biography	5	
QA21-29	Mathematics	4	

QA126.17	Computer science	4	
OB15-36	Astronomy	5	
QC7-16	Physics	5	
QD11-22	Chemistry	5	
QH15-21	Natural history	5	
QK15-31	Botany	5	
QL15-21	Zoology	5	
QM11	Human anatomy	4	
QP21	Physiology	4	
QR21	Bacteriology	3	
S441	Agriculture	4	U.S. holdings strong
R131	Medicine	4	U.S. holdings strong
T15-40	General technology	5	
TA15-19 TA139-140	Civil engineering	5	
TC15-19 TC139-140	Hydraulic engineering	4	
TD15-19 TD139-140	Environmental technology	4	
TE15-19 TE, 139-140	Highway engineering	4	
TF15-19 TF139-140	Railroad engineering	4	
TG15-20 TG139-140	Bridge engineering	4	
TH15-19 TH139-140	Building construction	4	
TJ15-20 TJ139-140	Mechanical engineering, machinery	5	
TK15-18 TK139-140	Electrical and nuclear engineering	5	
TL15-140 TL515-521 TL539-540	Motor vehicles, aeronautics	5	
TN15-19 TN139-40	Mining, Metallurgy	4	
TP15-140	Chemical Technology	5	
TS15 TS139-130	Manufacturers	4	
TR15 TR139-140	Photography	4	
TT15 TT139-140	Handicrafts	4	
TX13-140	Home economics	5	
Z5154.H57	Astronomy	5	
Z6660.8	Medicine	4	
Z7144.H55	Physics	5	
Z7405.H6	Science	5	
Z7914.H5	Technology	5	

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