Archival Collections in Physiology

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Archival collections are important in preserving our historical heritage. An example of a new archival collection in high-altitude physiology and medicine is described. Physiologists should be more aware of the historical value of primary material and should be encouraged to offer their papers to an appropriate archival repository.

All branches of science seek to preserve their history. Most people agree that it is important for historians and others to understand the origins of an area of knowledge. In addition, we like to recognize how developments have occurred over the course of time, to analyze the interactions between theory and experiment, and to review how institutional support (or its lack) has produced the state of knowledge as we know it today. It is noteworthy that the history of physiology differs from that of some other life sciences such as molecular biology in the sense that physiology is both very old and new. Its origins go back to the ancient Greeks, but modern physiology, which seeks to integrate molecular and cellular events with the behavior of the whole organism, is a phenomenon of the last few years.

What is an archival collection?

In its purest form, an archival collection is made up of the raw materials of science, including personal correspondence, scientific notebooks, experimental protocols, manuscripts, maps, films, videos, and perhaps oral histories, from people who have contributed to the development of an area of science. In practice, these primary materials, as they are called, are often combined with other materials such as reprints, books, and correspondence with family members and friends because researchers tend to keep all this material together. However, published articles and books are of lesser value in an archival collection simply because they are not unique and are generally available.

Of course, collecting this raw material is not science, although its subject matter is science and scientists. Nor is assembling an archival collection part of the study of the history of science. Rather, the objective is to make important material available to scholars who will subsequently sift through it and analyze its historical significance or use it for new research. It is useful to separate the two processes. It may be urgent to collect the material and, in particular, to make certain that valuable documents are not thrown away as has frequently occurred in the past. The subsequent analysis of the material can be done at any time by historians and others, providing the material is preserved.

An important feature of a good archival collection is that it is properly cataloged. This is normally done by professional archivists who examine the documents and categorize them in a manner useful to researchers. The topics are then entered into a computer database and made accessible through the on-line library catalog. Often this will be made available to people outside the host institution via the Internet. As an example, the contents of the archival collections in the Mandeville Special Collections Library at the University of California, San Diego (UCSD) can be seen on the World Wide Web at http://orpheus.ucsd.edu/specoll/testing/mscl-fa1.html. Online union databases of archival material are available. For example, the Online Archive of California allows access to repositories throughout California, including all University of California campuses, Stanford University, the Getty Museum, and the California State Library. Archival collections may also be cataloged in books, good examples being Archival Sources for the History of Biochemistry and Molecular Biology, edited by Bearman and Edsall (1), and the National Union Catalog of Manuscript Collections (NUCMC), published by the Library of Congress, 1959–1993.

This having been said, many archival collections contain uncataloged and even unsorted material. Cataloging is expensive, and many libraries will accept important collections on
the understanding that they will eventually be cataloged when resources are available. An example from my own experience is the extensive material that belonged to the Oxford physiologist Mabel Purefoy FitzGerald (1872–1973). When I visited the Bodleian Library in Oxford in the summer of 1998, I found that the material was kept unsorted in eleven huge cardboard boxes.

**Where are archival collections housed?**

Large libraries often have special facilities for archival collections. The material is kept in environmentally controlled rooms in which the temperature and humidity are regulated and monitored. Because some of the papers are unique and very valuable, special security systems are often in place. Typically, archival materials do not circulate but are read in the library under the surveillance of library staff. Only pencils or note-book computers are allowed in the reading room, and special supports are provided for older books.

However, many important archival collections are kept in less salubrious surroundings. As an example, I was disturbed to find that the enormously valuable archival collection of the Royal Geographical Society in London is kept in the attic of Lowther Lodge, an old Victorian house. One shudders at the range of temperatures and the obvious fire hazard.

Many university and other libraries keep archival collections in spite of the fact that they do not have elaborate facilities. Therefore, physiologists who feel that the work they have done merits a place in such a collection should certainly offer it to their university library.

**Archival Collection in High-Altitude Medicine and Physiology**

As an example of the development of a modern, though modest, archival collection in an area of physiology, the current project in the area of high-altitude medicine and physiology at UCSD will be briefly described. This came about because, in the course of researching material for a book on the history of high-altitude physiology and medicine, I collected a number of interesting documents. These include five unpublished, bound volumes containing all the publications of Carlos Monge Medrano, several theses on high-altitude pulmonary edema from Lima, Peru, early unpublished reports from the Fenn, Rahn, and Otis group prepared during World War II, and several letters from prominent contemporary physio logists. When I talked to librarians at the Mandeville Special Collections Library at UCSD, which houses several archival collections as indicated above, they raised the possibility of extending the collection and thus developing a current archive in the area of high-altitude medicine and physiology. I therefore wrote to a number of older prominent high-altitude physiologists and invited them to submit primary materials to the collection. Initially there was some confusion about what was wanted. Some physiologists responded by saying that they had rare books that might be suitable. However, it was explained to them that what we really wanted was primary material such as correspondence, notebooks, experimental protocols, photographs, and, eventually, oral histories. Another fertile source is living relatives of eminent physiologists who are now deceased. As an example, Dr. Steven M. Horvath, who is the son-in-law of David Bruce Dill, was able to donate some of Dill’s material, as well as his own.

A special feature of high-altitude physiology is that there have been a number of famous high-altitude expeditions over the years. These include the 1911 Anglo-American Pikes Peak Expedition, the 1921–1922 International High Altitude Expedition to Cerro de Pasco, Peru, the 1935 International High Altitude Expedition to Chile, and the 1960–1961 Himalayan Scientific and Mountaineering Expedition (Silver Hut). Apart from these major physiological expeditions, many other climbing expeditions such as the first ascent of Everest in 1953 and the first ascent of Everest without supplementary oxygen in 1978 had many interesting physiological overtones. Of course, the people who took part in these expeditions are known, and they or their descendants are being invited to donate material.

At the present time, the archival collection includes material collected from the work of a number of physiologists including Bruno Balke, Joseph Barcroft, E. H. Christensen, D. B. Dill, C. G. Douglas, S. M. Horvath, Ulrich Luft, J. S. Milledge, and M. P. Ward. However, interesting material has come from other sources as well. As an example, I became interested in the oxygen equipment that was prepared for the spring 1952 Swiss Everest expedition. The design of this equipment was inadequate in that it could only be used by the climber during rest and not during climbing. In fact, if the equipment had been engineered with a better understanding of high-altitude physiology, the Swiss would likely have had the distinction of making the first ascent of Mt. Everest. Happily, the whole file on the oxygen equipment was generously

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 donated to the archive, and this will make it easier for scholars interested in the history of high-altitude physiology and medicine, as well as mountaineering, to carry out research on related topics in the future.

Our collection is young, having been started less than a year ago. However, some interesting lessons have been learned. For example, some older physiologists are reluctant to part with their material even though it has been sitting in box files in their office (or garage) and has not been consulted for many years. Of course, this is no problem if the material is eventually donated to an archive somewhere. However, in a number of instances, we have been made aware of material that has been discarded because faculty members have retired or moved to smaller offices where there was insufficient space. It is sad to realize that much important material has been lost in this way.

Although we hope to develop a substantial collection at UCSD, we certainly understand that some physiologists will prefer to donate their material to their own institution or elsewhere. Accordingly, one of our objectives is to generate a list of archival sources. Again, reference can be made to the very extensive list of Archival Sources for the History of Biochemistry and Molecular Biology referred to earlier (1). In addition, some reference books such as The New Dictionary of National Biography (Oxford Univ. Press, in preparation) list archival sources for some high-altitude physiologists and physicians.

Historical resources in physiology

Archival collections as described above constitute only one of the many historical resources in physiology. Some physiological societies have their own archives, which principally contain information about meetings of the society, journals, and officers of the society. As an example, the [British] Physiological Society has an archive that goes back to 1876 (3), and the American Physiological Society has an archive that was greatly strengthened during the centenary celebrations of 1987. Some societies have archivists, although in many cases this will be an amateur historian. There are many books on the history of physiology generally and on its history in specific countries. There are also histories of physiological societies and also international events such as the international congresses of physiological sciences (2). Many universities, medical schools, and other institutions have programs devoted to the history of science or medicine, and their interests include physiology. One of the most active is the Wellcome Institute for the History of Medicine in London. Some historical studies use the World Wide Web. For example, there is an Internet forum on the history of the neurosciences (including neurophysiology) at http://www.medsch.ucla.edu/som/bri/archives/nahome.html.

Having said all this, a case could be made that contemporary historical studies in physiology are not as strong as in some other areas of science. For example, the Chemical Heritage Foundation, which was founded by the American Chemical Society, is very active and produces a fine news magazine entitled Chemical Heritage. The Foundation is based in Philadelphia, where it has a library, and it collects historical material from all around the world. It would be nice to see a similar project promoting the history of physiology.

References