

## *Introduction*

The *New Dictionary of Scientific Biography (DSB)* is a major addition to the magisterial compilation of scientific biographies edited by Charles Gillispie and published by Charles Scribner's Sons between 1970 and 1980. The original sixteen volumes of the *DSB* presented scholarly essays on the lives and careers of great scientists, mathematicians, and natural philosophers from the time of Thales, Hippocrates, and Aristotle to such twentieth-century figures as Hubble, Curie, and Einstein. In 1990, two new supplementary volumes were added to cover recently deceased figures such as Rachel Carson, Kurt Gödel, Werner Heisenberg, and Jacques Monod.

The *DSB* became an indispensable tool for a wide audience. For scholars it was a repository of authoritative biographical information and a portal to the best bibliographic sources. And for students and laypeople it provided an attractive new way to understand important scientific achievements. How better to appreciate a new concept or a new instrument than to read about the personal path that led to the innovation and to share in the excitement—and disappointments—that accompanied the scientist's discovery. The *New DSB* is committed to continuing that scholarly tradition into the twenty-first century and to extending its accessibility to a general audience through the addition of photographs of the scientists at work and images from their publications. As with the original *DSB* our goal is to identify the most noteworthy scientists and present the story of their accomplishments within the broader context of their lives in essays that reflect the best available historiographic research.

We have followed the original editorial policy of focusing on the natural and formal sciences. As the number of working scientists continues to grow, difficult decisions had to be made. The original *DSB* could undertake to cover every significant contributor to the Scientific Revolution or nineteenth-century chemistry. But we could no longer aspire to such completeness. So while not neglecting key figures in biology, chemistry, physics, and mathematics, we have endeavored to make sure that we had a crucial number of pioneers in the new sciences that are playing pivotal roles in today's society. Thus, we appointed special editors for ecology, ethology, computer science, decision theory, and space science. We also highlighted traditional disciplines that have matured and become more important, such as climatology, psychology, and physical anthropology.

The Advisory Committee wanted the *New DSB* to incorporate the very best recent scholarship in history of science studies. Thus we introduced Postscripts that update some

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225 of the original articles. A striking example is the entry describing Newton's alchemy, which adds a totally new dimension to our understanding of his matter theory; the Postscript on Mendel points out a surprising connection between his famous pea experiments and earlier discussions on heredity that took place at meetings of the Moravian Sheep Breeders Society; the new commentaries on Darwin and Freud provide excellent overviews of the vast new literature on these figures. These Postscripts are intended to supplement, not supplant, the original articles.

Thanks to extensive historical research on women in science, we now have much more information available about the contributions of people such as Ada Lovelace, credited with writing the first computer program; the astronomer Caroline Herschel, discoverer of numerous comets; and Maria Agnesi, who wrote a famous pioneering book on calculus. These new entries not only tell interesting stories about our intellectual foremothers but also provide valuable information about the social structure of the scientific community. The *New DSB* fills in other gaps, including additional Arabic researchers from the medieval period, African American scientists, and important figures from a variety of Asian countries.

Our understanding of both current and past science is shaped by philosophical and sociological theories about the structure and development of science. Included in the *New DSB* are biographical essays on figures who have shaped our current ideas about science: Thomas Kuhn's notion of paradigm, Karl Popper's falsifiability criterion, and Robert K. Merton's theory of scientific norms. Many of the new entries reflect the growing interest of historians in the social conditions and disciplinary organizations in which scientists do their work. Scientific achievements emerge out of a complex interplay between the conceptual frameworks available at the time and the sometimes-idiosyncratic views of the individual scientist, all moderated by the unflagging scientific demand for empirical adequacy and the quality control mechanisms of the relevant scientific communities.

The *New DSB*, with its integral print index in volume 8, can stand as a major addition to the original work. What will amplify its value in ways that we can scarcely foresee is the simultaneous publication of a fully searchable, electronic version that combines the original *DSB* volumes, including supplements, with the new series: the *Complete Dictionary of Scientific Biography*. Because this online "e-book" version is fully searchable, users of the *Complete DSB* will be able to pose questions that would elude even the best index. Compiling a list of scientists who spent time in Leiden or Indonesia will require only a few keystrokes. What about changing understandings of terms such as *gene*, *infinity*, *symmetry*, or *reflex*? A search of the *Complete DSB* will provide a wealth of clues to the evolution of these concepts. If so moved, a curious reader could even use the e-book version to dig up multiple examples of scientists who had a strong interest in music and mountaineering—or who committed suicide! Having an electronic version of the complete 26 volumes of the world's largest collection of scientific biographies will not only facilitate research but also lead to new avenues of inquiry about how science works. Furthermore, the *Complete DSB*, when integrated into a library's collection, becomes cross-searchable with a potentially limitless array of other reference works. The user can, for example, seek different perspectives on Galileo here and in the *New Catholic Encyclopedia* and the *Encyclopedia of Philosophy* or compare the history of science perspective on Darwin with that of present-day zoologists in *Grzimek's Animal Life Encyclopedia*.

A decade passed between the completion of the *DSB* and the appearance of its first discrete supplement (vols. 17 and 18). A further seventeen years stand between that supplement and the *New DSB*. Whatever the future of information technology may hold, it seems inconceivable that our present work will stand unrevised for so long. Already, in the *Complete DSB*, new material is interleaved with old. We expect that future additions and emendations will occur on a regular basis, and we welcome suggestions and corrections to the current volumes. In that spirit, we offer this new *Dictionary* as but a step toward the goal of continuous revision and updating.

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The quality of any collaborative project depends on the efforts and expertise of the Editorial Board. The *New DSB* has been especially fortunate to have such a knowledgeable and industrious group serving as editors. With the help of the Advisory Committee, twenty-three Subject Editors were selected. They played a leadership role in the selection of late-twentieth-century scientists to be included and the scholars to write the entries. To choose which of the original articles most needed new Postscripts, we solicited nominations from the history of science community and then relied heavily on the judgment of nine Editorial Consultants. We were fortunate to be able to draw on the editorial expertise of historians of science from Europe as well as North America. And we have authors from thirty-seven countries. Electronic communication made it possible for editors not only to collaborate with each other but also to interact with authors as they prepared their manuscripts. The authors were selected for their special knowledge of the scientists they were describing. The scrutiny of our academic editors and the fact checking of the copyeditors combined with the good reputations of our authors should result in biographies of the highest overall quality.

Although e-mail makes it possible to consult widely about matters both great and small, it is no substitute for being able to run down the hall to talk to a colleague. I would never have dared undertake such a project without the strong support of the historians of science and medicine at Indiana University, some of whom had been involved in the original *DSB*. Much of the scholarly work on recent scientists has been carried out by philosophers, and thus my colleagues in philosophy of biology and physics also provided valuable input. Thanks are also due to current and former graduate students in my Department, especially to Dr. Anne Mylott, whose efficiency and sage advice are reflected on every page of these eight volumes. Professional friends whose names do not appear in the roster of editors also played a crucial role—Abdelhamid Sabra and Loren Graham to name but two.

Frank Menchaca, senior vice president at Gale, took a personal interest in initiating the *New DSB* and coordinating the project with the American Council of Learned Societies, sponsor of the original *DSB* and benefactor of this continuation. John Fitzpatrick at Charles Scribner's Sons (now an imprint of Gale) facilitated the project from the outset and was an invaluable source of encouragement and solutions to seemingly intractable problems. And special thanks to Angela Pilchak at Gale. Her attention to detail, coupled with her tact and good sense, were absolutely essential to the timely and successful completion of the *New DSB*. Thanks also to Indiana University for office space and computer support.

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