Vignettes: Nomenclature

The Dolomites were named to honor the French geologist, Déodat de Grater de Dolomieu, Knight of Malta, captious adventurer, aristocratic adherent of the Revolution, august geologist. Dolomieu studied the Dolomites at the end of the 18th century. He studied Italian volcanoes, and knew that the heat could not come from combustion, but did not reach an alternative explanation. The common calcium-magnesium-carbonate mineral dolomite, whose reaction to dilute hydrochloric acid is to form slow-breaking bubbles, also honors Dolomieu as does the rock dolomite, a stone with 50% or more of the mineral dolomite. It is imprecise to give mineral, rock, and mountain range the same name. But geologists, who are little honored anywhere and sometimes ignored among more mathematical and experimental scientists, can rejoice in honoring the dead Dolomieu.

—M. *Dane Picard*, in *Mountains and Minerals/Rivers and Rocks: A Geologist's Notes from the Field* (Chapman and Hall)

The naming of the digits . . . can be traced back at least as far as Aethelbert, the first Christian Anglo-Danish king of Kent, who in A.D. 616 laid down a set of laws of compensation for the loss of fingers or thumb. King Alfred and King Canute, both thoughtful—if preoccupied (Alfred) or optimistic (Canute)—sovereigns, revised these laws and in so doing identified each digit by name. . . . The terms used by anatomists . . . are fairly obvious. *Auricularis* (little finger) denotes the digit most commonly employed to extract wax from the depths of the outer ear. The implication of *demonstratorius* (index finger) is self-explanatory, but why *impudicus* for the middle finger? . . . Professor Wood Jones, a great authority on the hand, preferred the term *obscenus* . . . to describe the digit that is used to express scorn and derision. The ring finger, the *annularis*, is again self-explanatory, although its synonym, the once widely used *medicus*, is not. . . . One suggestion that has been made is that this digit was used by medieval physicians to stir their cordials and nostrums.

—*John Napier*, in *Hands* (revised edition; Princeton University Press)

tional foothold there, but also how his domineering personality made it difficult to establish a school of followers. What Clements left to American ecology was thus an "ambiguous legacy"—a holistic attitude to nature, a physiological emphasis, and a set of ideas about biological succession, all of which affected ecosystem ecology, more as points of critical departure than as paradigmatic assumptions. As opposed to other historians of ecology, who have stressed the "dogmatic" influence of Clements's ideas, Hagen is at pains to show that science does not develop through dramatic revolutionary shifts of paradigm but rather through intricate patterns of change in which social, institutional, and personal factors interact with the theory and practice of research.

The rich social history that Hagen gives us of the early history of ecosystem ecology is extremely useful. But as he moves closer to the present day, he tends to limit his focus, and the book becomes a more traditional intellectual history. Hagen makes use of Chunglin Kwa's doctoral dissertation (in the Department of Science Dynamics at the University of Amsterdam), as well as Peter Taylor's research on Howard Odum, to show how ecosystem ecology was developed by the Odum brothers into a distinct scientific specialty in the 1940s and '50s. But he tells us relatively little about the other approaches to ecology emerging at the same time, or the important environmental debates and controversies that provided so much of the basis for the popularity and significance that ecosystem ecology would garner in the 1960s. By keeping his focus on the Odum brothers—and their colleagues within the "big ecology" projects of the International Biological Program—he misses some of the important social factors at work.

In the late 1960s, ecosystem ecology formed a significant strand of the broader environmental consciousness that was starting to emerge. The popular writings of the Odum brothers, as well as much of the voluminous literature in social and human ecology, were all affected by the ideas of ecosystem ecology. By going public, ecosystem ecology extended the range of its influence—in the social sciences, in environmental management, in engineering, and even in philosophy. But at the same time, as Hagen notes, ecosystem ecology tended to lose its authoritative status as an ecological specialty. Without a more detailed exploration of the interactions between ecosystem ecology and the broader environmental discourse, it is difficult to understand the changing fortunes of the specialty. Hagen has, however, given us a valuable survey of some of the field's most important intellectual sources.

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Getting Funded

A Guide to NIH Grant Programs. SAMUEL M. SCHWARTZ and MISCHA E. FRIEDMAN. Oxford University Press, New York, 1992. xii, 296 pp., illus. $39.95 or £32.

Science is done by scientists, not funding agencies, but not much can be done without financial support. The biomedical sciences and biology generally owe much of their explosive growth during the past 40 years to investigator-initiated projects supported by the external grants programs of the U.S. National Institutes of Health (NIH). Directly or indirectly, research not only in the United States but throughout the world has profited from those programs, which provide a success story unparalleled in the history of governmental support of both basic and clinical research. However, an investigator seeking support is not interested in history but in prospects, and no reader of *Science* needs to be told that the present situation and the view forward are by no means as rosy as those to the rear. An applicant needs all the help he or she can get.

This volume is in part a reference, containing tabulations of numerical information about NIH and descriptions of some of the labyrinthine procedures by which applications and grants are processed and administered, and in part a how-to guide for applicants. The authors are as familiar with the inside workings of the system as anyone could be; between them, they have held at least 11 responsible positions (listed on the dust jacket) in the vast NIH organization. The presentation is rather flat in style but lucid and straightforward.

Because the volume is a guide and reference to be consulted rather than a book to be read, it seems appropriate to list the chapters. After an introduction, chapters 2 and 3 list the 14 institutes and four centers, with their recent budgets, and chapter 4 lists types of extramural support mecha-

nisms. Chapter 5 deals with the preparation of an application. It can really add little to the instructions and explanations that NIH supplies with the forms, but there are many helpful minor suggestions. Chapters 6 through 11 deal with various aspects of the review system. They will be of little direct help to an applicant but will give a newcomer to the system some idea of what will happen to his or her application once it falls into the Great Black Hole of Bethesda. Chapter 12, dealing with decision points, communications, and appeals, is understandably the shortest chapter in the book, and could be further condensed; the two pages devoted to communications and appeals might be replaced by two words: Don't bother. Chapter 13 covers special topics such as use of human and other vertebrate subjects. Chapter 14 is a long list of sources of information concerning various programs. There are five appendixes. Appendix 2 lists 69 kinds of funding mechanisms. Traditional RO1 grants in support of individual investigator-initiated projects, which have been responsible for the scientific success of the NIH extramural program, received slightly less than half of the total funding in 1991. Most of the 68 other types of grants support training, upgrading of equipment, and the like, but a few provide direct research support for which some readers might be eligible.

The success of the hierarchical Manhattan Project and NASA in meeting engineering and technological goals leads many politicians and some NIH managers to think that basic research should be organized in units larger than the research groups of individual investigators, and there is an increasing tendency to favor such projects. To a reviewer whose experience, both as a formal site visitor and as an informal observer, leads him to suspect that all program projects contain components that would never have been funded on their own and therefore consume funds that could be better spent on individual grants, it is sad to learn from appendix 2 that program project grants already (1991) receive one-fifth as much funding as all RO1 grants combined. Sadder still, the overall funding rate for RO1 applications in 1991 was 28 percent, while that for program project applications was 51 percent. The implications for those who seek support seem depressing but clear.

One potentially useful suggestion is that, since traditional RO1 support is dwindling, applicants should familiarize themselves with the multitude of special programs of the various institutes and centers. The authors advise investigators to learn about RFAs (requests for applications), PAs (program announcements), and other solicitations and new mechanisms of support by getting their names on the mailing list of the *NIH Guide for Grants and Contracts*, in which those programs are announced. Fatuous and politically inspired though some of the programs may be, an investigator might possibly find a match with his or her interests and obtain funding with little competition.

This authoritative and clearly written book should be in libraries or departmental reading rooms wherever NIH-supported research is done. Chapters 4, 5, and 14 and appendix 2 may be useful to both new and experienced applicants.

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New Ideas in the Old World

The Scientific Revolution in National Context. ROY PORTER and MIKULÁŠ TEICH, Eds. Cambridge University Press, New York, 1992. xii, 305 pp. $54.95 or £35; paper, $18.95 or £12.95.

The present volume is the third collection of essays devoted to reinterpretation of the Scientific Revolution to appear in as many years. Such a spate of synthetic publications clearly indicates that earlier prognostications heralding the expiration of the early modern period as a promising area of investigation were untimely. In recapitulating the findings of recent work in the field and in suggesting new research opportunities, the essays in this and previous volumes should restore confidence in the rich dividends that are still awaiting researchers in a period that was once thought to have been studied to death.

Porter and Teich's decision to structure the volume along national lines, and thereby highlight the interaction between the distinctive social and political characteristics of various countries and new world views generated during the era of the Scientific Revolution is, essentially, a good one. Equally promising is the group of ten leading scholars assembled to address the theme. Unfortunately, the execution of the task at hand appears to have faltered for lack of clear editorial guidance. My suspicion is that the authors were given only vague recommendations on how to define the "Scientific Revolution," what its general chronology ought to be, and where the intersection between the general and the particular might take place. Left to their own devices, the various authors proceeded either to interpret for themselves what was expected of them or to expound the same topics they usually do. The result is that the book suffers from an unevenness of quality and lack of cohesion.

With this said, it should be added that many of the individual contributions are very fine indeed. Both Laurens Brockliss and Harold Cook succeed in mixing synthesis and analysis in their discussions of, respectively, France and the Low Countries. Brockliss depicts a society that, after a long period of indifference, came increasingly to appreciate and participate in the new science. Indeed, not only did the pursuit of science become an important feature of French cultural life, the interest in experimental science became a craze after 1660 even among the fashionable Parisian elite, fomented by a host of itinerant lecturers as well as by popular books and periodical literature. This burgeoning interest in the new modes of thought in a country that remained predominantly orthodox in its catholicity was, in no small part, a consequence of the failure of a militant Counter-Reformation to exert full control over the intellectual life of the country—in contrast to what occurred in Spain, for example. Such a combination of belief and relative freedom from clerical interference explains both the theological underpinnings of Descartes's and Gassendi's rivaling versions of the mechanical philosophy and the manner in which Cartesianism, in a sanitized form, could emerge triumphant at the turn of the 18th century and take hold of the Académie des Sciences as well as the institutions of higher learning—the Jesuit colleges included.

Cook presents an equally sweeping account of the emergence in the Low Countries of a sizable and active community of individuals committed to the new science, both in and outside the universities. Cook emphasizes, correctly, the need to look beyond mathematics and the physical sciences if we are to appreciate fully the nature and scope of early modern Dutch (and European) interest in science. Natural history and the life sciences (the disciplines that then constituted "big science") attracted the most attention. The almost indiscriminate gathering of information and the attention to detail that characterized such studies, continues Cook, reflected the predilection of the society at large, as well as served as a powerful model for natural theology, which saw in this accumulation of details the best proof of the glory and wisdom of God.

The important, and not necessarily negative, role played by religion in fashioning response to the new science is emphasized even more strongly by John Henry's account of the English scene. Henry detects an inextricable link between the peculiar nature of English natural philosophy in the 17th century—partly mechanical, partly chemical, occasionally vitalistic, and always experimental—and the religious orientation of the