legislature had fully occupied the field.

Gardner demonstrates conclusively that all parties to the controversy acted at times unwisely and inconsistently and that responsibility for the tragic episode was widely shared. All concerned were slow to achieve a mature understanding of the situation and the issues pertaining thereto; all were slow to take a considered and firm stand. The controversy took shape out of an effort to implement a policy which all parties, with varying degrees of understanding and assurance, seemed to accept, namely, that membership in the Communist Party disqualified a person from membership on the university faculty. The controversy in its final stages, as Gardner sees it, became a struggle between the regents and the academic senate for control of the university, particularly in relation to the appointment, promotion, and dismissal of faculty members.

Part of the injury to the university occurred in 1956, when, very belatedly, the American Association of University Professors censured the administration of the university. This token censure was removed two years later and is probably to be understood as expressing the desire of the AAUP to underscore the discrepancy between the position of the regents, the president, and the senate of the university that a disciplined Communist was automatically lacking in the objective and scholarly qualities expected of a member of the academic profession, and the AAUP position that no professor, not even a Communist professor, should be dismissed except on an explicit showing that his teaching or his scholarship was unsatisfactory.

Even though this reviewer was a participant in the AAUP discussions and decisions in 1956, he now believes that the AAUP must be included in the judgment that all parties to the oath controversy acted with something less than adequate understanding and wisdom. In retrospect he feels that the position taken by so many intelligent and honest people in California that proved membership in the Communist Party was inconsistent with objective scholarship cannot be said to have been so unreasonable as to have justified the censure sanction invoked by the AAUP. The basic AAUP position that a faculty member must not be dismissed except where adequate evidence is adduced proving an absence of professional fitness cannot be said to be unreasonable either. But the record suggests that no university has yet been able to devise and follow in practice a satisfactory system of "adducing evidence" of professional unfitness. This failure is not difficult to understand. For one thing, such a system would appear to require more "police work" by a university in collecting evidence than is either practicable or tolerable. The choice may be between giving up on the idea that a tenured teacher can be dismissed when professional unfitness is proved and automatic application of certain standards, such as dismissal for proved membership in an organization like the Communist Party that is known to subject its members to a measure of intellectual discipline inconsistent with acceptable scholarship. Our knowledge and experience in the academic profession to date suggest that, if these are in fact the only alternatives, the former is the more attractive one. But is it too much to expect the profession, perhaps led by the AAUP, to establish and implement expectations of teacher-scholars with respect to such personal qualities as integrity, civility, and decency, and such scholarly qualities as objectivity? Failure to move in this direction may well prove to be a factor undermining the rationale for academic tenure.

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## Geological Papers

**Source Book in Geology, 1900–1950.** KIRTLEY F. MATHER, Ed. Harvard University Press, Cambridge, Mass., 1967. 453 pp., illus. $12.50.

In 1939 Mather and Mason published their well-known *Source Book in Geology*, which was reprinted in 1964. In that book "contributions originating since 1900 were not considered, nor has the work of living geologists been included," a sound historical principle. Now, at the end of the second third of the 20th century, we have sufficient perspective from which to view some of the "spectacular advances" in geology since 1900, and of necessity the work of some still-living men must be included. The new *Source Book in Geology, 1900–1950,* edited by Mather, contains excerpts on 28 broad topics from 65 articles by 63 authors, of which 41 are American, six British, four Russian, three each German and Swedish, and one each Austrian, Canadian, Finnish, Japanese, Dutch, and South African. All the articles are important, and many are basic to current thinking in both the main and the peripheral branches of geology.

Every reader will have his own list of "fundamental" papers or books since 1900, and one of the pleasures of reading the book will be comparison of his own choices with those of Mather. Geologists and others will find in no other book such a source of original information on current bases of geological thinking.

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## Guide to the Animal Kingdom

**The Larousse Encyclopedia of Animal Life.** McGraw-Hill, New York, 1967. 640 pp., illus. $22.50 until 31 Dec.; thereafter, $25.

It is extraordinary how many laymen still imagine that zoology involves the study of animals. It is for them, and for a few old-fashioned or nostalgic "zoologists," that this magnificent volume has been put together. The work is arranged in a strictly taxonomic order, which is made easier to follow by the inclusion, at the end of the book, of a guide to the classification that is followed in the text. The first 200 pages are devoted to invertebrates and the last 300 to birds and mammals, while the unfortunate fish, amphibia, and reptiles are squeezed into 130 pages in the middle. It is probably inevitable, in a volume so lavishly illustrated, that photogenicity should thus win out over numerical importance.

A dozen authors, all located in British institutions, have contributed to the text, with the largest share belonging to Maurice Burton of the British Museum of Natural History, who is also responsible for revising and adapting Léon Bertin's text on the reptiles, birds, and mammals, which is all that remains, except for some illustrations, of the French original. These authors have, however, bent over backwards to use North American examples and North American common names; this presumably reflects the policy of Robert Cushman Murphy, who has written a foreword and who is the only contributor to be acknowledged on the title page.

The 1000 illustrations, including 50 color plates, are for the most part ex-

cellent, but one is continually irritated by the lack of references from text to picture. It is difficult to escape the conclusion that the scholarly text was produced without regard to the figures and that the latter were then assembled by a picture editor and inserted in what he considered to be useful places. Even on the few occasions when anatomy is being discussed, there is no means of finding out whether there is a relevant illustration without referring to the index, and then only if one can guess the form selected. This is particularly marked, for example, in the discussion of the Cephalochordata, in which the text provides an admirable description of the habits and nature of Branchiostoma and describes in some detail those features of its anatomy that are commonly observed in a whole mount; the only illustration, however, is a reproduction of a transverse section. What the text properly refers to as the notochord is in the picture caption called "the spinal cord." This sort of thing, of which this is not a unique example, will be as bewildering to the layman as it is irritating to the professional.

None of this should be allowed to detract from the fact that this is unquestionably the best single-volume encyclopedia of zoology currently available and that, as such, it will fulfill a valuable function in making it possible for the layman, or the student, to find out something about the varied forms and relationships occurring in the animal kingdom. None of the individual sections is as complete, or as richly illustrated, as the comparable volume in Doubleday's series "Living [so and so's] of the World," but here at least they are to be found assembled in a single volume at a reasonable price. There is a considerable glossary, an excellent bibliography of popular works for further reading, and a really admirable index.

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## A Great Man from Close Up

**Niels Bohr.** His Life and Work as Seen by His Friends and Colleagues. S. ROZENTAL, Ed. North-Holland, Amsterdam; Interscience (Wiley), New York, 1967. 355 pp., illus. $9.

Originally published in Danish in the fall of 1964, two years after Bohr's death, this posthumous tribute is now available in English. The book contains 22 illuminating essays on Bohr's scientific, administrative, and social activities, and describes his intellectual background and scientific achievements both in physics and in the philosophy of science.

The authors of these essays either are prominent physicists who are or were at least briefly members of Bohr's famous Institute of Theoretical Physics in Copenhagen—P. A. M. Dirac, W. Heisenberg, L. Rosenfeld, O. Klein, H. B. G. Casimir, O. R. Frisch, A. Pais, Ch. Møller, and V. F. Weisskopf—or they were personal friends or relatives of Bohr or had close social relations with him—Viggo Kampmann, the former Prime Minister of Denmark; E. Rüdinger, Bohr's long-time assistant; J. Pedersen and R. Courant, intimate friends of the Bohr family; and Niels's son Hans, whose contribution "My father" concludes the series of articles. In addition, the book contains a reprint of Bohr's "Open Letter to the United Nations" (1950), which urges a realistic approach toward solving the grave and pressing problems that confronted humanity in the aftermath of the Second World War—and that do so today.

The volume offers an intimate glimpse into the personal background of various periods of Bohr's life, starting from his early childhood (described by his relative David Jens Adler), and it treats in detail his patriotism and public-spirited activities in Denmark (Mogens Pihl), as well as his involvement in international affairs (Weisskopf, Hans Henrik Koch, Kampmann). Valuable—and in part not generally known—information on Bohr's important role during the war years and immediately thereafter is contained in Stefan Rozental's and Aage Bohr's contributions, and his interests in philosophy, psychology, and the problems of everyday life are vividly brought into relief by others (Jørgen Kalckar, Dirac, William Scharff, Mogens Andersen). Bohr emerges as a figure of outstanding ingenuity and highest nobility of character. The book describes the rich and harmonious life of Denmark's "first citizen": a leader in science who laid the foundations of modern atomic theory, Bohr also took keen interest in the political questions of his time (without, however, being associated with any political party)—both these activities being the result of his uncompromising search for perfection.

As far as Bohr's work is concerned, the presentation is less satisfactory, a fact for which, however, the contributors are not to be blamed. They were assigned to write not only for the specialist but also for the lay reader, and the sections relating to Bohr's scientific contributions had to be written in a nontechnical language, losing thereby much of the necessary accuracy of formulation and desired succinctness of style. The second and perhaps decisive reason for this drawback lies in the fact that Bohr was as much a philosopher as he was a physicist; the intricate interplay of these two strands in Bohr's creative work is a subject of great subtlety and hardly amenable to penetrating analysis within the limits of such short essays. Léon Rosenfeld's article on the consolidation and extension of Bohr's conception of complementarity is superb; but a study of the genesis and early phases of this most far-reaching conception of Bohr's is unfortunately lacking.

Furthermore, all authors of the articles dealing with Bohr's scientific work are declared adherents of the so-called "Copenhagen interpretation," a fact which finds its reflection in the total absence of any expression of a critical attitude. As a study of the Archive for the History of Quantum Physics clearly reveals, not all of Bohr's eminent pupils—and even "friends"—espoused the master's epistemological interpretation. In view of the actuality of these problems, it seems that the value of the book would have been greatly enhanced had one of these "friends-opponents" been included among its contributors. The example of Bohr's own contribution to a well-known Einstein volume (edited by P. A. Schilpp) supports this contention—and the fact that criticism and praise are not necessarily incompatible.

This last remark refers also to this reviewer's evaluation of the book. His criticisms should not be interpreted as dispraise of the volume under discussion, which he regards as a highly informative, illuminating, and important publication.

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