Book Reviews

The Origin of Species by Charles Darwin. A variorum text. Morse Peckham, Ed. University of Pennsylvania Press, Philadelphia, 1959. Illus. $15.

Forerunners of Darwin. Bentley Glass, Ed. Johns Hopkins Press, Baltimore, 1959. viii + 471 pp. Illus. $6.50.

The Autobiography of Charles Darwin 1809–1882. Nora Barlow, Ed. Harcourt, Brace. New York, 1959. 263 pp. Plates. $4.50.

The three books listed here are all equally important in this year of the Darwin centennial. One misses only the recognition of Alfred Russel Wallace to make the survey complete. Heading the list is the first variorum edition of the *Origin* to be produced. The second study treats extensively of certain of Darwin's known precursors, with intricacy and admirable scholarly detail, while the third gives, in a more unexpurgated form than has been previously available, Darwin's own account of himself.

It has taken the lapse of a full century to produce a variorum edition of *The Origin of Species*—this, in spite of innumerable changes in the text of the various editions, and in spite of the fact that a single volume containing the variant texts would have been an invaluable tool to the historian of science. At last such a book has been prepared, by Morse Peckham, an authority on Victorian literature and a keen student of Darwin.

The work covers all the changes in the six texts published between 1859 and 1872. In addition, Peckham has written a most informative introduction, replete with new information about the various editions and the history of their publication. The editor has searched out the publishers' actual records and has reproduced them; he has given careful descriptions of the several editions, and he has included photographs of the various bindings. He has done everything that a work of this kind demands, and he has done it with professional skill and exacting thoroughness. The volume should be of service to every student of Victorian literature in the country, and to every biologist and historian who is concerned with the development of Darwin's thought.

The scope of the changes Darwin introduced into the several editions is not only a mark of his restless anxiety about the volume but also an index of the forces that played upon his own thinking. As Peckham points out, it is difficult to find any library which possesses a run of all the authentic editions. Yet without the variant editions, or this variorum substitute, one cannot speak with authority about what Darwin said in the *Origin* at a particular time.

This work will become a researcher's classic and delight. Not content with his accomplishment, however, Peckham is already eager to extend his studies among Darwin's contemporaries and hopes to delve more deeply into the sources of Darwin's thought. The labor expended upon this volume is an index of his devotion to the subject.

Forerunners of Darwin begins with three excellent, individual papers—one by Francis Haber, "Fossils and early cosmology"; the other two by Bentley Glass, "The germination of the idea of biological species" and "Maupertuis, pioneer of genetics and evolution." In the latter paper Glass develops at length, and convincingly, Maupertuis' role as an early evolutionist and geneticist. It is the finest paper in English upon Maupertuis' role in French biological thought. Bentley Glass' expert knowledge of genetics has enabled him to bring out fully the surprising modernity of Maupertuis' thinking.

On the other hand, I would differ slightly with Glass about what he terms the fantasies of de Maillet or Buffon. The works of these gentlemen had wide distribution and profound effects upon human thinking. They, like Maupertuis, had their insights as well as their follies. There is honor enough for all, and the years devour men's writings quickly—almost as quickly as they devour the men themselves. This trickle of evolutionary thought that passes thinly across the border of the 19th century is the product of several, if not of many, minds. We shall do well to speak gently of these men, in the hope that our own fantasies may be spoken of with like gentleness two centuries farther on.

The volume contains a wealth of other material. It is, in fact, a very difficult book to review in a short space. The subject matter, although primarily concerned with evolution, is diverse, many-sided, and exceedingly rich. Lester Crocker writes upon Diderot; Jane Oppenheimer pursues "An embryological enigma in The Origin of Species"; Oswei Temkin has produced a much-needed paper, "The idea of descent in post romantic German biology"; and Charles Gillispie devotes a searching paper to Lamarck's ideas.

The richest ore of all lies in Arthur Lovejoy's collected papers upon evolutionary subjects, which are scattered through the volume. Every student of the history of ideas will be overjoyed to find that these precious papers, so long buried in a diverse range of journals, have now been rescued and placed within the compass of a single book. Lovejoy on Buffon, Lovejoy on Chambers, Lovejoy on Kant and Schopenhauer, Lovejoy on Herder—all are as fertile and suggestive as they were when they were first published. The fact that the history of ideas and of science is now a subject of growing academic interest in America we owe to the pioneer efforts of Lovejoy, among others. The History of Ideas Club at Johns Hopkins University deserves public thanks for its part in recognizing the permanent value of these papers and in helping to insure their preservation in lasting form.

The new edition of Darwin's autobiography, edited by Nora Barlow, his granddaughter, is the first complete and unexpurgated edition of that document, some parts of which had been suppressed upon its first publication out of deference to people then living. Even at the time of Darwin's death emotions still ran high over the religious storm the *Origin* had evoked. This storm was reflected in family counsels and in divided loyalty, on the part of the children, between their father's science and their mother's religion. Nora Barlow has incorporated, in this edition, an appendix treating of the Darwin-Butler controversy, along with various other family memorabilia.

Reading the volume after the lapse of years, one finds oneself touched anew by its simplicity and pleasant informality. The effect is one of bringing the reader into almost conversational reach of the great scientist. "I have attempted to write," Darwin himself informs us, "as if I were a dead man in another world looking back at my own life. Nor have I found this difficult for life is nearly over with me. I have taken no pains about my style of writing." There emerges in the *Autobiography*, for just this reason, something of that flowing, effortless style which makes *A Naturalist's Voyage Around the World* so at-

tractive to us still. Charles Darwin was not without literary sensitivity, despite his complaints about his own stylistic awkwardness and despite his sprawling, leaping, cryptic condensations when the creative ferment was working in him too rapidly for him to control his sentences.

The expurgated material is not startling by modern standards, but it does help to round out our picture of the man and his time. His original theism apparently ebbed with the years, until he became a total agnostic. His lingering Lamarckian conceptions of inheritance led him to comment that the inculcation of religious beliefs in children might cause them to inherit a belief in God. As a sensitive and considerate man, it is evident that the struggle and suffering observable in the natural world offended Darwin's moral sensibilities and led him ever further along the pathway of doubt. It is obvious that he suffered, as did many intelligent Victorians, including Wallace and Lyell, from the great and painful reorientation in human thinking to which he was, at the same time, a leading contributor.

Nevertheless, what was in some ways a sad life intellectually is illumined by Darwin's deep affection for his family, his winning whimsicality, and his genuine devotion to science. There is something a little wistful, a little fey, about his devotion to the lower organisms—almost as though he would have liked to start the whole evolutionary process over again down a different path. "It has always pleased me to exalt plants in the scale of organised beings," he wrote of his botanical experiments, just as he sometimes dwelt upon the intelligence of his earthworms. Yet if men and human cruelty sometimes offended him, no man ever left a more moving tribute to his wife. Written at the end of a letter of hers which he had obviously treasured, is the following: "When I am dead, know that many times I have kissed and cryed over this. C.D."

Into the modern world of doubt and atoms, into the world which has slain its millions in two great, fanatic wars and which now hovers on the brink of a third —a world which has devoted itself to the principles of struggle and made this tired, disillusioned man the spokesman of its philosophy, come these words out of the past. Do they ring strangely in our ears? If so, it will be a measure of how far out of humanity we have grown, and of why Charles Darwin turned to the observation of plants and earthworms in his last years, and of why it pleased him, in his own words, "to exalt plants."

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Biological Sciences

Living Resources of the Sea. Opportunities for research and expansion. A Conservation Foundation study. Lionel A. Walford. Ronald Press, New York, 1958. xv + 321 pp. Illus. $6.

Marine science until recently was a rather academic discipline, regarded with some tolerance as a sort of hobby with no particular application, pursued by zealots—often bearded. Among the marine sciences, biology was considered perhaps the least practical.

Yet, rather suddenly, the exploding world population and the much less rapid expansion of food supplies have caused people to look to the sea as a possible source of food. In recent years there has been a spate of articles and books on the general theme that the sea is an inexhaustible supply of material and food. The approach of many has been starry-eyed—feed the starving millions with plankton, or raise *Chlorella* to relieve famine in India. "Let 'em eat plankton" might serve as a paraphrase of the general theme.

In contrast, Walford's book takes a hard look, appraising the state of marine science today, particularly marine biology. He raises many questions and answers them to the best of modern knowledge. What do we actually know about the sea, about its plants and animals? How are the resources of the sea now used? How can use be expanded? What do we need for further expansion? What lines should further research and development take? Yet, along with the sometimes brutally frank exposé of current ignorance, there is also the plan of a practical man who knows what has been done and what needs to be done.

Walford is eminently qualified to handle such problems. For many years he was head of all marine biological research for the U.S. Fish and Wildlife Service. He serves on many commissions and committees of international scope for evaluation and study of marine problems and has been chairman of the research committee of the International Commission for the Northwest Atlantic Fisheries.

The book details the strength of our knowledge of marine resources where there is strength but does not hesitate to reveal the weaknesses. The two great shortages—of money and of trained manpower—are mentioned again and again. The sea is no less mysterious in some of its aspects than is outer space, but the amount of time and money going into study of the sea is a minute fraction of that spent on space research.

Although Walford himself is a biologist, he does not neglect the technological and even sociological aspects of the problem. Proper development of a new fishery involves biological research on the animals to be exploited. It also involves engineering research into sorts of gear to be used for their capture, design of new boats or adaptations of old ones, economics of financing the fishery, problems of distribution, and—not least—the sociological problem of convincing people that they should eat an unfamiliar food. Here the strength of this book becomes evident, for each of these problems is taken realistically in turn, and the approach is neither optimistic nor pessimistic. Manpower, money, and time are the ingredients which can solve these problems.

The construction of the book is logical. There are two major sections—one, the definition of the problem; the other, a survey of the known resources. The many maps with descriptive captions actually written into the chapters as an integral part of the text are a unique feature.

One might wish that some of the maps were not so detailed and that more consideration had been given to the problems of printing, but in general they make their points. This is not a textbook and does not need full documentation, but the documentation is unfortunately uneven and often difficult to follow. The index leaves much to be desired.

Nonetheless, here are the facts presented—that the sea is grossly underexploited; that expansion of utilization of marine products along the lines we are presently following can probably only double production; that great areas of the sea and significant numbers of its animals are relatively unknown. Current work is directed toward learning more about known factors rather than exploring the unknown. Unless we redirect the research forces we now employ and create vast new ones, man may discover, when he is actually driven to the sea for a major part of his food, that he will be unable to find it.

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Electronic Apparatus for Biological Research. P. E. K. Donaldson and others. Academic Press, New York; Butterworths, London, 1958. xii + 718 pp. Illus. $20.

Biophysicists are frequently asked to name a single textbook or monograph from which a biologist not familiar with advanced electronics and having only rudimentary physics and mathematics at his disposal can learn enough electronics