BOOK REVIEWS

A Recent Huxley

If I Am to Be Remembered. The Life and Work of Julian Huxley, with Selected Correspondence. KRISHNA R. DRONAMRAJU. World Scientific, River Edge, NJ, 1993. xxiv, 294 pp. + plates. $38 or £27.

Julian Huxley. Biologist and Statesman of Science. C. KENNETH WATERS and ALBERT VAN HELDEN, Eds. Rice University Press, Houston, TX, 1993. xii, 344 pp., illus. $32.50. From a conference, Houston, Sept. 1987.

In *If I Am to Be Remembered* Dronamraju has written an old-fashioned biography of Julian Huxley. We are told of Huxley's great achievements and contributions. He was also a real brick of a fellow. Reluctantly Dronamraju mentions "several mistakes" that Huxley made. Huxley also had a few "bouts of displeasure when he thought that a certain author had failed to acknowledge his scientific work" (p. xxviii), but if he ever behaved badly to other human beings or had an uncharitable thought we do not hear about it. The least one expects of such a biography is a coherent chronology, but the course of events in Huxley's life gets lost as Dronamraju jumps back and forth in time from one subject to another. He frequently pads his narrative with long quotations from letters, and he appends over a hundred pages of Huxley's correspondence. A few of the letters are interesting, but most are samples of the mundane correspondence of any professional. In his conclusion, Dronamraju remarks that the two volumes of Huxley's autobiography are "remarkably bland" (p. 172). So is Dronamraju's jumble of a biography.

The proceedings of a conference held at Rice University, where Huxley taught from 1913 to 1916 and where his papers now reside, make up for the deficiencies of Dronamraju's book. In the introduction Kenneth Waters sets out a clear chronology of Huxley's life from his birth on 22 June 1887 during Queen Victoria's Jubilee, through his schooling and series of university positions, to an abortive engagement that landed him in a sanatorium. Soon he was joined by his younger brother, Trevenen, whose own depression led to suicide. Huxley eventually married a French-Swiss governess, Juliette Baillot, in 1919 and had two sons and a second nervous breakdown, this one caused apparently by his feelings of inadequacy as a teacher. He resolved this problem by resigning his position at King's College London to work with H. G. Wells on a three-volume introduction to biology. In 1929 on a trip to Africa he met a young American woman and promptly informed his wife of his plans to marry her and move to America. When these plans fell through, he and Juliette were reunited in 1932 as married companions.

In 1935 Huxley was persuaded to take on the post of Secretary of the Zoological Society of London, a position that paid a very good salary and included two residences, one in Regent's Park and another at the Whipsnade branch of the zoo. However, the Council of the Zoological Society became increasingly dissatisfied with him. They thought that he did not spend enough time on his duties and that when he did concern himself with them he tended to interfere in petty ways with the running of the zoo. In 1942, while Huxley was visiting the United States, the Council voted him out. Huxley was very bitter. Until this episode the Old Boy network had served him very well. Three years later Huxley became secretary of a committee charged with setting up an agency of the United Nations to encourage education, science, and culture—UNESCO. A third nervous breakdown did not keep him from becoming the first Director-General of this agency.

Julian Huxley as a young man. [From the dust jacket of *Julian Huxley*]

After his stint at UNESCO, Huxley never took on another regular position but spent the next 27 years traveling, writing, and lecturing as a part of the international intelligentsia. He was elected a Fellow of the Royal Society, received several important medals and prizes, including the Royal Society's Darwin Medal, the Kalinga Prize for the popularization of science, and the Lasker Award for his work on behalf of Planned Parenthood. In 1958 he was knighted. He also had three more nervous breakdowns, in part brought on by anxieties over whether he actually deserved the honors that were being conferred on him. All in all, during the course of his life Huxley published eight scientific books and over 125 scientific papers, most of the latter between 1921 and 1939. In addition, he published or edited over 60 books of more general interest as well as wrote 600 articles, reviews, and notes. He died 14 February 1975 at the age of 87.

The 19 authors who have contributed to *Julian Huxley: Biologist and Statesman of Science* provide new perspectives on Huxley's life and work. Colin Divall argues that Huxley contributed to the transformation of late Victorian and Edwardian science into modern science, a transformation, however, that Huxley himself was unable to make. Jan Witkowski and Frederick Churchill present insightful discussions of Huxley's early experimental work in laboratory science, especially in experimental embryology. This work served to establish him as a genuine scientist. Richard Burkhardt details Huxley's contributions to ethology. While not debunking his work, Burkhardt insists that Huxley hardly deserves to be termed the "father" of ethology. Rather, he succeeded in professionalizing this area of science.

William Provine, Robert Olby, John Beatty, and Waters discuss Huxley's contribution to the Modern Synthesis in evolutionary biology and the extent to which this synthesis was a genuine "synthesis." Provine insists that Huxley succeeded in eliminating apparent inconsistencies in evolutionary theory by restricting the number of mechanisms that contribute to the evolutionary process. Later evolutionists not only constricted the synthesis even further but also hardened it. Beatty and Olby remind us that, constricted as Huxley's view of the evolutionary process may have been, it was much wider than the versions of evolutionary theory championed by other founders of the Modern Synthesis. Waters thinks that the Modern Synthesis was a synthesis, but in the sense that it provided

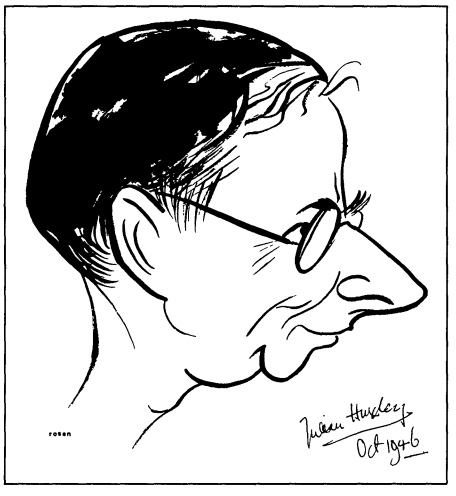
a common conceptual framework for people working in a number of different fields.

In the literature of the past couple of decades, eugenics has become the *bête noire* of liberal and leftist students of science, so much so that previous commentators on Huxley hardly mention his extensive contributions to this cause. In a surprisingly sympathetic discussion, Garland Allen rectifies this omission. Most important, he distinguishes between old-style and reform eugenics. Old-style eugenicists overemphasized heredity to the almost total exclusion of the environment, exhibited a simplistic understanding of genetics, not to mention race and class biases, and had a strong preference for conservative politics. Reform eugenicists, by contrast, had a more sophisticated understanding of genetics and evolutionary theory, especially with respect to the role of the environment, as well as an awareness of the fallacies of race and class bias, and tended to be politically liberal to radical.

Diane Paul and Elazar Barkan agree with Allen but emphasize how porous and changing the boundary between "mainline" and "reform" eugenics was. For example, Huxley emphasized the importance of genetic diversity in evolution and was, for his time and station, politically left. Paul notes that his student H. J. Muller was even more radical in his political leanings but emphasized the culling effect of natural selection. Although Muller did not think that selection would produce an "ideal man" (or woman), he did think that natural selection would constantly cut down on the amount of genetic diversity in a species. Barkan does not want Huxley to slip too easily off the pin upon which historians have mounted him for inspection. Although Huxley was uncomfortable about it, he held during the course of his lifetime various racist beliefs and attitudes. For example, his fear of the population explosion was based not on numbers alone but on the composition of those peoples who were increasing most rapidly.

In his contribution, Daniel Kevles chronicles Huxley's success as a popularizer. In his popular writings Huxley championed social causes as much as he brought science to a wider audience. He was a feminist of sorts, endorsing divorce and birth control. Although at times he may have been patronizing in his attitudes toward other peoples, he actively opposed the racist views of the Nazis. But what Huxley enjoyed most was bringing his love of the living world to a wider audience. D. L. LeMahieu, however, reminds us of how small Huxley's audience actually was. The most popular journal in which he published sold only about 50,000 copies per issue, most of his books sold fewer than 5000 copies, and the sort of radio program to which he contributed attracted an audience too small to measure statistically, probably less than one or two percent of the listeners. The chief exception was "The Brains Trust," which drew almost 30 percent of the listening public at its height at the end of World War II, and Huxley was its most popular participant. Huxley did help to popularize science among educated intellectuals, but he left the great mass of Britons untouched.

A recurrent issue in the collection under review and in the larger literature on Julian Huxley is the extent to which he was a genuine scientist as distinct from a popularizer and statesman of science. Another is how much of Huxley's fame stemmed from his accomplishments and how much from his name. As Churchill shows, Huxley continued to publish on animal behavior throughout his life in addition to producing a constant stream of more popular works, but his work in experimental embryology all but ceased in 1939 and was replaced by contributions to evolutionary biology. Even those tapered off after the publication of his most influential work, *Evolution, the Modern Synthesis*, in 1942, but in 1942 Huxley was 55, an age at which many scientists begin to slow down. Certainly polls indicating that the general public considered Huxley to be among the five best brains in Britain, ahead of Ernest Rutherford and Bertrand Russell, did not help his reputation among his fellow scientists. As is usually the case, Huxley's popular success detracted from his professional reputation. His name both helped and hurt him. It certainly opened doors, but living up to such an illustrious name also placed a heavy strain on him, a strain that periodically got too much for him.



"Cartoon of Julian Huxley dated 1946." [From *If I Am to Be Remembered;* Huxley Archives, Woodson Research Center, Rice University]

In general, the collection put together by Waters and Van Helden is history of science at its best. My only complaint is that periodically I detected a slight whiff of Whiggism. None of the authors is especially guilty of reading present-day science back into Huxley's work or criticizing him for not holding the scientific views that we now do, but on occasion authors seem not only to note Huxley's positions on social and moral issues but to condemn him for holding them. But isn't racism wrong regardless of what racists might think? But isn't the sun in the middle of the solar system regardless of what geocentrists might think? As Olby remarks, "If we are going to judge Huxley, let us do so in terms of [his] generation and not our own."

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Matters of Scale

Toward a Unified Ecology. T. F. H. ALLEN and THOMAS W. HOEKSTRA. Columbia University Press, New York, 1992. xiv, 384 pp., illus. $45 or £50; paper, $28 or £20. Complexity in Ecological Systems Series.

Ecology is complicated business. At one level, myriads of plants, animals, and microbes are involved in fixing carbon and cycling hundreds of nutrients and other chemicals through dozens of pathways. These are ecosystem (with a little *e*) processes. Understanding the stoichiometry of these processes does not require a detailed knowledge of the species that participate in them, and, indeed, ecosystem studies can become intractable when individual species are considered. But ecology involves more than ecosystem processes, and species *are* important at these other levels of investigation. When species are added to an ecosystem, an Ecosystem (big *E*) emerges and an orders-of-magnitude jump in complexity occurs. An investigator confronting an Ecosystem is obligated to understand ecosystem processes, the processes that are occurring in scores of different populations, and a multitude of interpopulation interactions—all simultaneously.

Reducing Ecosystem complexity into something intelligible is clearly a daunting task. Ecologists have largely attempted to do this by creating subdisciplines that concentrate on small pieces of the big picture. Thus basic ecology has split along aquatic and terrestrial and plant and animal lines; these in turn have fragmented further into organismal, population, community, and ecosystem ecology, each with its own paradigms and styles of investigation. An even wider gulf has developed between basic and ap-