Book Reviews

The Eugenics Movement

Eugenics and Politics in Britain, 1900–1914. G. R. SEARLE. Noordhoff, Leyden, The Netherlands, 1976. viii, 148 pp. Dfl. 45. Science in History, No. 3.

Some historians believe that a knowledge of the past is useful for avoiding blunders in the present. Historians of science who are of this inclination have a number of paradigm cases at their disposal and, not surprisingly, one of those cases—the eugenics movement—has been subjected to increasing scrutiny in the last few years. Searle's volume (actually it is little more than a long essay) is only one of a number of books and articles that have appeared recently on eugenics; it is neither the best nor the worst of the lot but is, as they say, a useful addition to the literature.

The eugenics movement was an attempt to bring the principles of the new science of genetics to bear on the formation of public policy. The movement was international in scope but was particularly prominent in the United States and Great Britain between 1900 and 1930 and in Germany for several unfortunate years beyond that. Despite national differences in emphasis and tone the underlying principles of eugenics were everywhere the same: heredity is a stronger determinant of human characteristics than environment; the improvement of society is dependent upon the improvement of the race; the improvement of the race cannot be accomplished without following the laws of genetics; thus the breeding habits of human beings are proper matters for governmental scrutiny and the laws of the state should be based upon the laws of genetics. Professional biologists were prominent in the eugenics movements in all three countries; indeed, according to Searle (and others) it was the presence of these experts that made eugenic policies increasingly attractive to the public.

The eugenists met with varying degrees of success. In all three countries specific items of legislation were passed—sterilization laws, immigration restriction acts, institutionalization of the "feeble-minded," inducements to childbearing among the "fit"—which were enforced with varying degrees of severity. Perhaps more significantly than this the eugenists also succeeded in influencing public attitudes, thus legitimizing and institutionalizing a kind of racism that had always existed but that had not previously been validated by science (only by religion). This racism was the ideological underpinning for specific acts of public policy which at first glance do not seem to be related; policies as disparate as income tax reduction for parents and the neocolonial wars can be viewed in this light. One cannot read either the popular or the intellectual press of those countries in those years without becoming depressingly aware of how pervasive and subtle the influence of eugenics really was; from the pages of the pulp romances to Werner Heisenberg's diaries, everything seems to have been tinged by its presence.

Some analysts of the eugenics movement believe that we are witnessing a resurgence of its claims, this time impelled by fears about overpopulation of the globe. As more and more biologists have come out of their laboratories to make pronouncements about social problems (a practice that was once common only among physicists) more and more historians have turned their attention to the older eugenics movement in the hope, sometimes expressed, sometimes (as in the volume under review here) not, that a reminder of what happened and what was said 50 years ago will serve as warning to those who would be quick in their judgments in the present.

The American and German branches of the movement have been studied extensively by historians, but, curiously, the British version, which was the precursor of them all, has been neglected. Thus Searle's book is the first extended discussion of the British eugenics movement to be published by a nonpartitipant (though the British movement has been the subject of at least one doctoral dissertation: Lyndsay Farrell, "The Origins and Growth of the English Eugenics Movement," Indiana University, 1970). Its strength lies in the author's ability to set the movement into the context of contemporaneous British politics; Searle demonstrates that the popularity of the movement was due neither to Darwin's theories of natural selection (which had been enunciated 40 years earlier) nor to Galton's application of what he took to be Darwin's theory to human populations (Galton coined the word "eugenics" in 1883) but to the availability of the eugenic theories at a time when British national consciousness was assailed by self-doubt attendant upon the waning of the Empire. The eugenics movement was not an isolated phenomenon, according to Searle, but was the response of a certain conservative (and powerful) section of the professional middle classes to the national debates on racial degeneration, national efficiency, unemployment, National Insurance, the Poor Law and the People's Budget—not to speak of the Boer War and the German incursions in Africa. Havelock Ellis, Leonard Darwin, Beatrice Webb, Harold Laski, J. B. S. Haldane, J. M. Keynes, and Winston Churchill may have agreed on very little else, but they were all eugenists at some time in their careers. The sections of this volume in which Searle deals with the ideas of the eugenists and their reactions to the politics of their time are the strongest in the book. The author's narrative skill is considerable; those sections are concise and to the point, faintly barbed but solidly based on original sources.

Unfortunately there are counterbalancing weaknesses.. The book is too short and the period under discussion too brief; one really wants (and needs) to know what happened *after* 1914, when Britain's troubles increased tenfold and when the eugenics movement in other countries was really getting up steam. In addition Searle says almost nothing about the scientific issues involved; this is not the book to turn to for an informed discussion of the differences between the Mendelians and the biometricians, or of the implications of Weismannism for biology, or of the advances (such as they were) in human genetics that were made during this period. Although Searle insists that many biologists and physicians were involved in the movement he cannot tell us whether they played a significant role or whether the movement had significant effects upon their work because he has not dipped into the literature of the professional biologist at all but only into the literature of the movement—the minutes of the Eugenics Education Society and the public utterances of its spokespeople. Searle is also given to a certain vagueness and ambiguity about persons, places, and things: Bateson is pronounced an opponent of eugen-

ics in one place and becomes a proponent in another; Churchill undergoes the same transformation; speakers before the society are referred to as "Dr. Clouston" or "Dr. Mott" with their first names never proferred; and unidentified abbreviations abound, leaving the unfortunate reader to decide what it could possibly mean to "call an A.G.M." or "work for the L.C.C." The weaknesses of the book are unfortunate, for its strong parts are sufficiently sophisticated to warrant the judgment that if the author (and the editor) had spent more time on it it could have been the definitive work on the subject.

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Vertebrate Structures

Problems in Vertebrate Evolution. Papers from a symposium, London, Jan. 1976. S. MAHALA ANDREWS, R. S. MILES, and A. D. WALKER, Eds. Published for the Linnean Society of London by Academic Press, New York, 1977. xii, 412 pp., illus. $36.10. Linnean Society Symposium Series, No. 4.

If this symposium has a less apparent overall theme than is usual in the Linnean Society's symposia it is perhaps a tribute to the breadth of researches undertaken by T. S. Westoll, the dedicatee. Westoll's interests have spanned a wide range of primitive fishes, and he has given special attention to the fish-tetrapod transition. Because Westoll's contributions have been fundamental it is unfortunate that a bibliography of his papers is not included in this volume. The quality of the papers presented in the book is high, however, and some are fundamental contributions. They may be grouped by subject into four categories: the nature of calcified tissues, the anatomy of Paleozoic fishes, the postcranial skeleton of coelacanths and tetrapods, and relationships of placoderms, acanthodians, lizards, and birds.

The papers dealing with calcified tissues should find a wide audience, for they are all important summaries. Bobb Schaeffer demonstrates the importance of interactions between epithelial and mesenchymal tissues in the dermal skeleton of fishes. The differences between cellular and acellular bone, enamel and enameloid, and bone and dentine arise from shifts in the timing and duration of particular morphogenetic processes; past speculations on which member of each of these pairs is the more primitive are weakened. Of particular interest is Schaeffer's discussion of the involvement of neural crest material in (probably) all dermal calcifications.

Tor Ørvig summarizes knowledge of odontodes, discussing the ontogeny, function, derivatives, and phyletic history of these toothlike structures of the dermal skeleton (often called dermal denticles). Ørvig believes odontodes to be the precursors of the dermal skeleton, as well as one of its major components.

Keith Thomson discusses the biology of cosmine, a hard tissue of the skeleton found in a variety of fossil fishes. He shows that in crossopterygians cosmine is an active tissue undergoing extensive resorption and deposition related to such phenomena as mineral storage and protection. Cosmine also contains the minute network of the pore-canal system, which appears to have been electroreceptive, differing from electroreceptors of living fishes in being integrated primarily within the canal network rather than being under more direct control of the central nervous system.

Colin Patterson has studied the relationships between endoskeletons and exoskeletons of vertebrates and found no instances of interchangeability between the two. He reviews delamination theory and finds most applications of it to be unspecific; the only direct attempt to apply it cannot withstand criticism. Patterson's overall conclusion is that the dermal and endoskeletons have always been distinct, as far as is documented in known animals, and that theories postulating the induction of one by the other are readily falsified.

One of the most extensive summary papers in this book is by Alec Panchen, who reviews the complexities of tetrapod vertebrae. Although Panchen's results are essentially negative, his approach is explicit and the paper is a classic review of this difficult problem; a clear discussion of the differences in ontogenetic, anatomical, and serial homology among various vertebral structures is given. Panchen concludes that there is phylogenetic continuity between vertebral structures of osteolepid crossopterygians and those of temnospondyl labyrinthodonts and postulates a separate origin, within crossopterygians, for the anthracosaur-reptile groups. Microsaurs are not lepospondyls; the vertebral structure of living amphibians provides no evidence concerning their affinities with Paleozoic groups.

The other papers are all of interest to vertebrate morphologists and paleozoologists but in general deal with more specific problems of anatomy and relationships. H. P. Whiting reidentifies cephalaspid cranial nerves and modifies Stensiö's classic account of them somewhat; the result is that the cephalaspids show an even closer similarity to petromyzontid lampreys, the pride stage in particular. Brian Gardiner and A. W. H. Bartram demonstrate homology in cranial anatomy of primitive palaeoniscoids and crossopterygians; these two major groups of bony fishes thus seem more closely related than some workers (notably Jarvik) have supposed. Roger Miles and G. C. Young revise the curious placoderms, Erik Jarvik sees similarities of acanthodian fishes to elasmobranchs, S. M. Andrews reinterprets the axial skeleton of *Latimeria* and compares it with that of tetrapods, Alick Walker provides an alternative to the currently well-documented theropod origin of birds, Robert Carroll finds the origins of lizards within particular eosuchians but sees *Sphenodon* as a separate issue of that group, and F. R. Parrington interprets retention of neck intercentra in reptiles as providing the kind of flexibility offered by opisthocoelous or flattened cervicals in later mammals.

There are few typographical errors in this satisfying volume, and the overall enthusiasm of the articles, surely due in part to the authors' pleasure in honoring Westoll, makes it one of the more interesting and readable recent volumes in the field of vertebrate morphology and evolution.

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Membrane Biology

Electrical Phenomena at the Biological Membrane Level. Proceedings of a meeting, Orsay, Oct. 1976. E. ROUX, Ed. Elsevier, New York, 1977. xvi, 566 pp., illus. $65.50.

Most of the material in this collection of papers is available elsewhere in published form, and some has been superseded by more recently reported work. On the whole, however, the juxtaposition of diverse, loosely connected topics is useful, particularly for someone trying to survey several fields of current interest quickly. I found the volume introduced me to interesting lines of work relevant to my own interests, and I suspect it will serve the same purpose for others. That, after all, is one of the things a good symposium should do.

There are papers on lipid monolayers and bilayers, theoretical discussions of