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BIOLOGY AND MAN by George Gaylord Simpson. Harcourt, Brace & World. 175 pp. $5.95

by Joshua Lederberg

"Biology and Man" is a collection of ten essays, many of them published before in scholarly journals, by one of America's best known and highly respected students of animal and human evolution displayed by the fossil record. Several of his essays are written from a platform of unassailable competence, and make rewarding reading, equally for style and for content. His discussions of the biology of race, of the significance of the evolutionary concept for human nature, and of the biological foundations of language are unexcelled in writing addressed to a general audience.

Simpson's final chapter, "Biology and Ethics", is an outstanding critique of many contemporary efforts to derive ethics from naturalistic or scientific principles. His criticism is too effective to leave very much standing, and he makes few pretensions for any system of his own. He does make the powerful point that the essential contribution of science is not to ethical theory but ethical practice, through the power and responsibility of rational foresight. Ignorance is bliss, for we can then ignore the unforseeable consequences of our acts, and therefore suspend ethical judgment altogether. (I would interpolate that this may be the most threatening aspect of scientific discovery: when we know that malnutrition stunts the growing mind, how can we ignore the consequences of world poverty?)

In the end, Simpson suggests that ethical systems be "adaptive to existing conditions." He may be closer to Julian Huxley than he admits, if this means placing a high value on the continuity of human evolution. Or perhaps I single out this element as a projection of my own views.

The first few chapters, on the current situation in biology, are marred by a peevish and poorly informed attach on molecular biology, which he believes is overemphasized in contemporary research, on mission-oriented research, on the space program in general, and on exobiology, the effort to find evidence for extra-terrestrial life, in particular. His style in these discussions is to erect a straw man from unrepresentative quotations of untenable statements, then generalize to the whole field with a dogmatic pronouncement far removed from the informed detachment with which he deals with his own science. Thus, exobiology is "unscientific" because there is no conclusive evidence for life anywhere beyond the earth (agreed!) and because Simpson is convinced that "the chances of usefully communicating with intelligent beings anywhere else in the universe are effectively nil" (a rash assertion when there is no evidence on either side). In fact, exobiology is pursued because conclusive evidence for or against extraterrestrial life is a matter of overriding importance to solidify our understanding of biological evolution. I suspect that Simpson's impatience with this effort is connected with the reliance it must place on biochemical methods of analysis, and interpretation.

Perhaps we had better take this all in fun. We can, after all, be encouraged that recent trends, both in molecular biology and in space research, are more to his liking. It is harder to know what to make of this remark: "all attempts to answer that question ("What is man?") before 1859 are worthless and that we will be better off if we ignore them completely." On the other hand, post-Darwinian biology is equally fruitless: "in my opinion nothing that has so far been learned about DNA has helped significantly to understand the nature of man or of any other whole organism." It helps to understand Simpson's frame of reference by his response to some humanists' attack on science as "uncultured": that he will choose his own definition of culture, "just the way people live."[2] Perhaps science

in general is simply that which paleontology illuminates, and molecular biology does not.

I am no less enthusiastic an evolutionary biologist than Simpson. The evolutionary perspective is the principal theme of my own interest in DNA. We should hardly turn up our noses at quantitative measurements, for example that the human DNA comprises five billion nucleotide units packaged in 23 pairs of chromosomes and that this is about a million-fold increase in genetic complexity over the simplest viruses. Molecular biology is hardly a derogation of Darwin; it is more nearly a fulfillment of his insights in convergence with other sciences. (I hasten to add that far more vital insights about man were articulated before 1869.)

The history of academic biology is full of a glaring anomaly. Many students of naturalistic and systematic biology have paid lipservice to evolution as the central principle of biology. At the same time, they compartmentalized the subject into plants and animals, and specialized divisions of them, like vertebrates versus invertebrates. Woe to the young physicist who might want to turn to biology and concentrate on what was common to life on earth generally! I can still recall my vivid astonishment that one of my most gifted colleagues was deterred from an appointment at a major university because, as a biophysicist he was not prepared to concentrate on either botany or zoology, and in fact intended to work mainly on bacteria and viruses. Unfortunately, these primitive and experimentally accessible forms of life were scarcely recognized in the academic schedules of the time.

Simpson's misguided complaints about molecular biology belong to the same era. They might be left with the snows of yesteryear. However, we are entering a period of newfound concern about the rational management of the biosphere,

in effect how to keep the earth habitable for man, his crops, and a wildlife whose importance we only begin to recognize. As never before we need to integrate every available insight we can find. The accumulation of hard pesticides like DDT is, for example, a matter of deep concern. To understand its significance we surely need field observations on vulnerable species. We need to understand individual variation in response within species. We also need chemical studies on the distribution and ultimate disposition, if any, of DDT. Finally, we must not neglect the molecular biology of DDT effects, which can only be understood by an examination of the biochemistry of protein synthesis, and the distoriton of enzyme patterns that DDT can induce in low concentrations. Unfortunately, Simpson's negative and petulant criticisms of molecular biology may impede the development of ecological research as the kind of integrated biology he so vehemently demands.