Book Reviews

Darwin's Philosophy and Methods

The Triumph of the Darwinian Method. MICHAEL T. GHISELIN. University of California Press, Berkeley, 1969. x + 290 pp., illus. $7.50.

This is an excellent book with some questionable points, which include its possibly misleading title. Let us first consider its excellence.

Since the publication of the *Origin of Species* in 1859, there has been a constant stream of studies of Darwin, and this became a flood during and following the centennial celebrations of 1959. It has since seemed impossible to say anything both new and important about Darwin, but Ghiselin has accomplished that feat. Most studies of Darwin have concentrated on his one most famous book, with perhaps some mention but little analysis of others. As for his philosophy, there has grown up a sort of legend that Darwin had none, or at most was a naive and almost unconscious philosopher. His methodology has been little discussed and when mentioned has usually been assumed to consist essentially of reasoning from induction and analogy.

Ghiselin has changed all that. He has restudied almost all of Darwin's works, apparently excepting only short journal articles. He has especially focused attention on Darwin's philosophy and methodology and, in their light, the reasons for Darwin's successes and failures.

It is curious that what is really, in terms of time and bulk, Darwin's major single work, the four-volume monograph on fossil and recent barnacles, has been either passed over in silence or treated almost apologetically by most commentators. It has indeed been mysterious that the intention to describe one species grew into a complete monograph of a whole great group, past and present, and that Darwin devoted some eight years to studies not obviously related to his most important work. Ghiselin argues convincingly that the barnacle researches were an essential phase in the testing of the grand hypothesis of evolution and the integration of numerous subsidiary hypotheses. "The completed work was nothing less than a rigorous and sweeping critical test for a comprehensive theory of evolutionary biology." There follows a good example of Ghiselin's short and sometimes diverting way with dissenters:

> The literature abounds in assertions that it is impossible to derive, through taxonomic study, such knowledge of phylogeny and evolutionary mechanisms as Darwin did in fact obtain. Those who make such pronouncements habitually argue from the premise that they, personally, cannot see how it could be done. Their argument combines the modesty of Schopenhauer with the logic of Mary Baker Eddy; it does not follow from their own lack of imagination that Darwin or anyone else must fail.

Thus a case is made out that it was just this generally neglected monograph that really initiated the Darwinian revolution in the study of organisms.

Almost all other aspects of Darwin's work are similarly treated in a frequently fresh and always interesting way. The other major topics are: geology, biogeography, natural selection, taxonomy, teleology and design, variation, psychology, and sexual selection.

Ghiselin has also been successful in another of his aims: he convincingly demonstrates that Darwin did indeed have a consistent and conscious philosophy. That is touched on here and there throughout the book, but most extensively in the chapter on teleology and design, curiously titled "A metaphysical satire." The argument cannot be summarized adequately here and must be read. It concludes as follows:

> It is true that [Darwin] restricted the philosophical pronouncements in his writings to problems closely related to his scientific work. This, however, may be taken as a sign of wisdom rather than disinterest. It is abundantly clear that Darwin rejected questions of ultimate reality as unanswerable. . . . His position on metaphysics scarcely differs from that of a number of modern philosophers, and we can hardly blame him for being a century ahead of his times in yet another field. Those who condemn Darwin as incompetent in philosophy do so either from ignorance of his ideas, or because they, personally, would prefer to reject his conclusions.

Darwin's position is shown to be essentially that of a present-day logical positivist.

Ghiselin's other main aim, and the one his title is meant to imply, is to demonstrate that Darwin had a consistent methodology which was the so-called hypothetico-deductive procedure now commonly associated with the name of Popper. Definite examples of the formal sequence of hypothesis, deduction, and tests capable of falsifying the deduction and hence the hypothesis do indeed occur in Darwin's work. The same could be said of any fairly prolific, not wholly descriptive scientist, before or after Darwin. Demonstration of the extent and the ways in which Darwin used that method is another excellence of Ghiselin's book, but it is also here that questions begin to arise.

For Ghiselin the hypothetico-deductive method is "the modern scientific method," it is characteristically Darwinian, and its present implied universality is a Darwinian triumph. But such attempts to reduce scientific methods to a single paradigm either make that paradigm so broad as to be virtually meaningless or ignore methods that do not fit the paradigm but that nevertheless are used logically and effectively in science. Examples of both failings occur in Ghiselin's book. When taxonomy of cirripeds is considered as "hypothetico-deductive" overall, that term has been extended beyond any current and precise definition. That the method is applicable to distinctly historical problems, or was so applied by Darwin, whose work was so extensively historical or retrodictive, is at least debatable, obviously so because it is warmly debated. In support of his extreme position, Ghiselin takes Darwin's "work on coral reefs [as] an almost ideal model," but Darwin himself emphasized that the method of that one work was quite different from any other by him, and so it is. Ghiselin insistently denies that Darwin was an "inductionist" (he puts the word in quotation marks), but Darwin said that his work was usually inductive. It is

almost incredible that Ghiselin's reaction should be to label this "hypocrisy" and to hold that Darwin was only giving "lip service to 'induction.'"

One can find both induction and deduction in Darwin, as well as methods not reasonably designated as either. Darwin's methodology was thoroughly eclectic. One aspect of his genius is that his methods were not uniform but were brilliantly adapted in each case to the diverse problems attacked.

Even the addition of Ghiselin's strikingly original contribution to the enormous body of Darwiniana does not put an end to needed studies. Ghiselin has clarified most of the important relevant issues and definitely settled some. However, as was humanly expectable, he has left some as obscure as ever, perhaps in one or two instances even more so. It is surprising that this should be true in some respects of his treatment of such subjects as natural selection or blending versus particulate inheritance. His occasional lapses are far from typical, and it is to be hoped that he will himself return, rethink, and rewrite here and there. The book as a whole is already unquestionably one of the very best on Darwin and his work.

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Research Strategy for a Pressing Question

Social Status and Psychological Disorder. A Causal Inquiry. BRUCE P. DOHRENWEND and BARBARA SNELL DOHRENWEND. Wiley-Interscience, New York, 1969. xvi + 208 pp. $9.50. Wiley Series on Psychological Disorders.

One of the most consistent and no doubt the most provocative of the findings so far produced by epidemiological research is that there is a relation between social class and psychological disorder. Although the specific shape of this relationship has varied from study to study, apparently as a function of the size of the city or community under investigation, the consistent finding has been that the lowest status group is substantially overrepresented among the psychologically disordered. For at least three decades a controversy has raged over the interpretation of this relationship, with the "social selection" and the "social causation" hypotheses the major explanatory contenders. The central concern of this book is an exposition of the background and content of this critical controversy along with the presentation of a research strategy that is presumed to offer a solution. A second issue addressed is the pervading one of the validity of existing measures of psychological disorder.

In the field of social research, it is not usual to find investigators who develop and pursue a long-range program of research involving visible and systematic steps toward resolving a major, pressing question. The Dohrenwends are such a research team. This book is, in part, a chronicle of their efforts both to refine theory and to resolve related problems of method. Some of this work has previously appeared in professional journals and is collected here in revised and expanded form.

The style of presentation in this volume indicates the authors' recognition that questions of validity and interpretation in reference to epidemiological findings are more matters of persuasion than of demonstration. Their various conclusions are developed in a series of arguments that draw in a scholarly fashion upon a wide range of research findings. In this process, what is provided in the way of review, organization, and interpretation of available research is in itself an important and highly useful contribution. Indeed, I am not aware of any other similarly concise source that provides as good an exposition of the current state of both knowledge and confusion in the field.

In their typically systematic style the Dohrenwends devote the first four chapters to a review of thought and research associated with questions about the role of heredity versus social environment in the etiology of psychological disorders. Within this review, the following conclusions are developed: (i) The investigation of the relation between objective social status and psychological disorder requires the study of untreated as well as treated cases because rates estimated on the basis of only treated cases are unavoidably influenced by a host of extraneous factors. (ii) In studies of the relation between psychological disorder and the objective social variables of age, sex, ethnicity, and socioeconomic status, only the relation with socioeconomic status appears unequivocal and therefore to offer leverage that may be applied to the etiological question. (iii) Genetically oriented studies have pointed to the existence of a genetic factor in the etiology of schizophrenia, at least, and perhaps of a variety of other disorders. Although it is widely assumed from such results that nature and nurture interact in the etiology of at least some forms of disorder, the relative importance of hereditary and social environmental factors remains in dispute. (iv) Other studies specifically aimed at determining the relative importance of heredity and environment, including studies of adopted children, geographic mobility, and social mobility, have been inconclusive—in the last case, the Dohrenwends say, largely because the studies have not provided information about family history with respect to psychological disorder.

The authors next develop their central argument that a naturally occurring situation provided by the process of ethnic assimilation in relatively open-class societies may provide a quasi-experimental design for a crucial test of the etiological issue. Three assumptions underlie this strategy: (i) It is an almost universal norm of open-class societies that upward social mobility is desirable. (ii) Serious psychological disorder involves disability that decreases the probability of upward mobility and increases the probability of downward social mobility. (iii) There is greater downward social pressure on members of disadvantaged ethnic groups than on their class counterparts in more advantaged ethnic groups. From these assumptions specifically contrary predictions are derived concerning rates of disorder in advantaged and disadvantaged ethnic groups within the same social class. The social selection hypothesis (oriented toward a genetic explanation) would predict higher rates in a particular social class (presumably the lower class) among those in advantaged ethnic groups. This follows from the assumption that there is greater downward social pressure on disadvantaged groups, such as Negroes and Puerto Ricans, which causes more of their healthier members to be retained in low status thereby diluting the rate of disorder. If, however, such rates are mainly a function of social pressures and forces, higher rates should be observable in disadvantaged ethnic groups than in their more ad-