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.

G. G. SIMPSON
Harvard University, Cambridge, Massachusetts, and *University of Arizona, Tucson*

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-

vantaged class counterparts. Thus the Dohrenwends take the position that this major substantive issue could turn on a simple question of empirical fact: do disadvantaged ethnic groups have higher or lower rates of psychological disorder than their class counterparts in more advantaged ethnic groups?

Most of the rest of the volume is devoted to the development of a theoretical frame of reference intended to extend the authors' efforts at resolving the etiological issue and, at the same time, to provide a framework within which construct validity for measures of psychological disorder can be more productively sought. As before, the various assumptions and conclusions embodied in this extended formulation are bolstered with informative reviews of theory and research.

The starting point for this elaboration is a discussion of persistent disorder versus situational specific symptoms. Research is reviewed indicating that stressful contemporary circumstances generate a wide range of psychological symptoms in otherwise normal individuals, symptoms that tend to be self-limiting, persisting in the absence of stress only in those who experience secondary gain from their expression. From a review of information on the effects of very extreme environmental situations, the authors conclude that some such events can produce persistent or irreversible psychological disorder in the absence of secondary gain. They argue, however, that lower class environments do not in any sense approximate such extreme environmental events and that such conditions cannot be said to distinguish the lower-class environment from the environments of more favored classes; the "social deprivation and pressure experienced by children and adults in the lowest social stratum are not severe enough to produce self-perpetuating psychological disorder in otherwise normal human beings" (p. 125). The specification of "otherwise normal" presumably refers to persons without genetic defect. The crucial hypothesis involved here appears to be that there is no such thing as environmentally produced personality defects and, therefore, that symptoms that persist in the absence of stress situations or secondary gain are of genetic origin.

Several additional propositions follow from this and are explicitly stated: (i) Psychological symptoms in community populations are of three types: those that are situationally induced and transient; those that are situationally induced and persist because they are supported by secondary gain; those that arise from defects which are probably of genetic origin and persist in the absence of secondary gain. (ii) Higher rates of psychological disorder are found in the lowest class because all these types of symptoms are likely to be inversely related to social class: the first, because stress situations are harsher in the lower class; the second, both because of harsher stress and because secondary gain is more probable in the lower class; the third, because of the process of social selection operating upon the less able within the society.

The relevance of this extended formulation to the book's central question may now be clear. It is that we can move toward an understanding of the relative importance of genetic and social environmental factors in the etiology of psychological symptoms by discovering the relative proportions of "defect generated" and "situation induced" symptoms. The over-all strategy involves comparing these distributions across advantaged and disadvantaged ethnic groups, with social class controlled.

There is much in this formulation that can, and no doubt will, be disagreed with. The centrality of the issues involved, the scope of the theoretical frame of reference, and the courageous specificity of the propositions are themselves sufficient to guarantee wide dissent in a field as diverse in its formulations and allegiances as this one. A few instances of potential disagreement may be cited:

Perhaps the most controversial proposition is that environmentally produced personality defects either do not occur or are not relevant to psychological disorder. While many may accept the assumption that "insofar as genetic defects are the main basis of symptoms, the symptoms would prove persistent" (although I know of no evidence that genetically generated symptoms are necessarily wholly consistent or persistent), the obverse of this, that symptoms that persist (in the absence of stress or secondary gain) can be assumed to be genetic in origin, cannot be so readily accepted and is not argued in a wholly convincing fashion. Judgment on this matter would seem to turn, in part, upon the question of what sorts of behavior and feelings are to be considered as representing psychological disorder. If personal and social incompetence, feelings of hopelessness and powerlessness, low self-esteem, or the anxiety and depression which have been shown to frequently accompany them are included, there would seem to be much evidence contrary to the assumption. If such conditions are excluded (and many believe they should be), it is quite another matter.

A second point of contention arises from the now widely held view that it is not productive to address the question of the relative contributions of heredity and environment—that the central issue is rather the nature of the genotype-environment interaction. Thus, even given acceptance of the proposed dichotomy of symptoms, two critical questions remain: (i) Are there any genetic contributions to symptoms that are primarily environmentally induced—either from differential vulnerability to stress or from a differential tendency to experience secondary gain? (ii) Are the occurrence and expression of "genetically induced" symptoms malleable, and if so to what extent, by developmental or contemporaneous environmental factors?

There are a number of practical problems associated with the Dohrenwends' research strategy which, although well recognized and being worked with, seem to present formidable difficulties. Among these is the requirement for determining the absence of both stress and secondary gain in order to classify symptoms as "genetically induced." Given the assumption of variable thresholds for the experience of stress, it may often be difficult to infer absence of stress except from an absence of symptoms. The determination of secondary gain seems equally difficult. Although the authors skillfully argue that secondary gain is more likely in the lower class, they employ ecological correlations from which they deduce the probable benefit versus censure resulting from symptom expression. That the issue of secondary gain or symptom reinforcement may not always be so straightforward on an individual basis is suggested by the widely held conclusion that some children do not fail to learn to read but learn not to read, often as a function of reinforcements that have the appearance of censure.

The issues cited are among several that must be raised in relation to the Dohrenwends' formulation. For the most part, however, they are more in the nature of open questions than of specifiable defects. Although I view the

full research strategy as somewhat less powerful than the authors claim, I am convinced that it promises a significant contribution to our understanding of the matter. Their detection and utilization of a naturally occurring situation to develop a quasi-experimental research strategy is itself somewhat of a landmark. As a total work, the book is of substantial importance. Wherever its propositions and arguments are given the careful study they deserve, it is bound to spark lively debate and probably will stimulate research efforts. It seems to me that no better recommendation can be given to a scientific work.

R. JAY TURNER
Temple University
Community Mental Health Center, Philadelphia, Pennsylvania

Skills of the Eskimos

Hunters of the Northern Ice. RICHARD K. NELSON. University of Chicago Press, Chicago, 1969. xxiv + 432 pp. + plates.

In recent years the Eskimo villages of northwest Alaska have received considerable attention from anthropologists. Published community studies deal generally with the various aspects of contemporary Eskimo life, but none has focused on a particular aspect of Eskimo culture. Nelson's book does just that. His is a systematic study of modern and traditional methods of hunting, travel, and survival on the sea ice based on firsthand experiences in the villages of Point Hope, Wainwright, and Point Barrow between 1964 and 1966.

In an appendix Nelson documents the methods of full participation that enabled him to obtain his information. He rightly points out that previous arctic ethnographers have seldom participated fully enough in Eskimo subsistence activities to describe them in meaningful detail. By maintaining himself as a hunter, Nelson documented subsistence techniques in such a manner that he believes they could be used successfully by persons who have not observed them at first hand.

The major part of the book is divided into two parts, the first of which deals with the development of sea ice and its conditions throughout the lengthy period of the year when it is present in the vicinity of the villages of northwest Alaska. Emphasis is on the manner in which Eskimos recognize and interpret the signs that are characteristic of the ever-changing ice. What is revealed is the complicated body of knowledge and techniques that lies behind the adaptation that Eskimos have made to one of the most extreme environments on earth.

Part 2 deals with the biological environment. Chapters are devoted to each of the major animals utilized by the Eskimos. Such factors as distribution and feeding habits, as well as the primary means of hunting the animals, are examined in detail. Although some attention is paid to traditional subsistence techniques, the emphasis is on today's hunting methods and equipment.

In a chapter entitled "The Eskimo as hunter" Nelson provides a subjective assessment of some mental attitudes possessed by hunters which appear to be specifically adapted to the exploitation of an arctic environment. These include self-assurance, perseverance, good physical condition, and, of course, knowledgeability concerning the environment. The reader is certain to agree with these points, but he may also be led to believe that all hunters possess these qualities to an equal degree when, in fact, in any village the expected range of competence is encountered. Even though the division of labor is minimal, there are some individuals who are simply not skilled at the activities in which Eskimos are supposed to excel, a fact the author does not stress sufficiently.

In the final chapter Nelson sketches in broad outline the effects of 100 years of culture change on hunting. Because of increased education and exposure to outside influences, young Eskimos are increasingly unwilling to undergo the arduous learning necessary to become skilled hunters. To Nelson this means that the native economy will die with the passing of the present generation, a point of view that may be overly pessimistic. More than most Eskimos, those in the coastal villages of northwest Alaska appear to be making a successful adaptation to a way of life which combines some traditional subsistence activities with participation in the wider economy through wage labor. Nelson is correct, however, in assuming that the "death of hunting" is inevitable, and his study is a masterly work of salvage ethnography.

JAMES W. VANSTONE
Department of Anthropology, Field Museum of Natural History, Chicago, Illinois

Human Genetic Polymorphisms

Genetic Markers in Human Blood. ELOISE R. GIBLETT. Davis, Philadelphia, 1969. xxviii + 632 pp. + plates. $15.

Human Blood and Serum Groups. OTTO PROKOP and GERHARD UHLENBRUCK. Translated from the second German edition (Leipzig, 1966) by John L. Raven. Interscience (Wiley), New York, 1969. xvi + 892 pp., illus. $45.

The recognition and analysis of human genetic polymorphisms have had both important theoretical and extremely practical implications. The discovery of the glucose-6-phosphate dehydrogenase polymorphism led not only to the first critical test of the Lyon hypothesis in man but also to the recognition of specific X-linked enzyme-deficient phenotypes, carried by millions of males in many parts of the world, which may affect their response to a variety of drugs, may influence their sensitivity to certain dietary constituents, and possibly may alter their resistance to malaria. In a similar manner, the elucidation of the complex genetic and biochemical interrelationships of the major red cell antigen systems has provided some of the most elegant examples of epistasis in man, and has also permitted the development of measures which should lead to the virtual eradication of erythroblastosis—once an important cause of neonatal mortality and neurologic damage. And, surely, the demonstration that one of the most alarming complications an anesthesiologist can encounter—namely, the failure of a patient to recover from the paralytic effects of certain muscle relaxants for many hours instead of a few minutes—is caused by homozygosity for a recessive gene, carried in the heterozygous state by many normal individuals, has provided a useful and satisfying answer to this life-threatening surgical complication.

Because of the relative ease with which samples can be obtained, genetic studies of human blood protein differences are far advanced in comparison with the analysis of human variation in other organs and tissues. However, there is little reason to doubt that, if similar studies were performed on the set of gene products that leads us to classify one group of cells as "liver" as opposed to the sets that distinguish other cells as being "kidney" or "heart" or "thyroid," a comparable degree of genetic variation and polymorphism would be found. Except in small or highly inbred populations, variation