THE NATURE-NURTURE CONTROVERSY

By

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With a Foreword by

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FOREWORD

SINCE DARWIN first horrified the orthodox by his theory of natural selection and its implication for the origin of human nature, study of the interrelations of heredity and environment has provoked lively controversy. Gradually, all theories of a preformed being with fixed innate characteristics have given way to conceptions of continuous adjustment, development, flow, and evolution.

The instinct theories which played a great role in psychology at the beginning of the twentieth century have been very largely abandoned as a result of increased knowledge of cultural anthropology and of the diverse patterns of value and action which human beings may develop under appropriate circumstances. The "libido" and "death instinct," which Freud first postulated, have been reinterpreted by contemporary analysts like Fromm and Horney to take more account of the social matrix within which love and hate, hope, despair, and aggression are nurtured. The simple inborn and unchanging I.Q. that we talked of in the early days of intelligence testing is now recognized to be a composite of many factors that fluctuate widely with extreme differences in opportunity, especially at early ages. Race differences which a generation ago were assumed to be innate are today more likely to be interpreted as a consequence of social barriers.

The latest controversy has been precipitated by Lysenko's attack on the Weismann-Morgan theories of the immutability of the germ plasm and its virtually complete independence of changes in the body of its host. Biology in the U.S.S.R. is now aligned by political pressure behind the theory that the germ plasm, like every other living substance in plants and animals, inevitably changes in adaptation to surrounding conditions of

nutrition and sustenance. Official Soviet scientists go further and proclaim, in opposition to "stagnant, bourgeois science," that "new characters acquired by organisms in the course of their development under the influence of a changed environment are transmitted to the offspring."

Dr. Pastore's contribution to these controversies consists in an exploration of some of the dynamic factors that may have influenced the leading scholars in formulating their inquiries and their interpretations. Dr. Pastore moves a little aside from the manifest content of the dispute to achieve some insight into the latent or related attitudes. He inquires whether the position a scientist will reach on a controversial intellectual issue can be predicted from some broader frame of reference. Dr. Pastore is careful not to draw the conclusion that the class position and political views of the investigator have determined his position on the nature-nurture controversy. He recognizes the possibility that broad social attitudes may have been derived from the rather narrow base of conclusions about heredity. Dr. Pastore himself seems to support the more plausible interpretation that there is interaction of a circular kind between the political and the psychological dogmas. Interaction, however, implies some effect of social assumptions upon scientific findings and correspondingly some departure from the ideal of objectivity.

The reader will recognize that Dr. Pastore's findings shed light, not only on the heat and bitterness of the nature-nurture controversy, but also on the functioning of the man of knowledge. If, in the particular case examined, the social goals of the scientist are so closely correlated with his laboratory findings and his classroom teachings, may this relationship not be expected in other controversies? What about current debates on race amalgamation, sex role, natural childbirth, self-demand feeding, and progressive education? The scientist, concerned for the achievement of an objectivity that is really free from prejudice and wishful thinking is forced to re-examine his ap-

proach. Dr. Pastore has included in his study scientists of great distinction—of topmost intellect, immense erudition, and irreproachable character. Yet the question remains whether even these very superior men had learned how to free their research from the limitations of their social frame of reference.

Scientists have heretofore hoped that the techniques of experimental method would suffice to achieve results independent of the investigator's preferences. Consequently, it is not customary for a biologist or a psychologist to preface his monograph with a statement of his political affiliations and philosophy of life. Rarely has a scientific discussion on a controversial issue, outside the social sciences, included deliberate effort to discount the possible effect of such a broad frame of reference. Dr. Pastore's book seems to call for a new advance in scientific methodology in the biological and perhaps also in the physical sciences.

GOODWIN WATSON

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CONTENTS

Part One

INTRODUCTION

THE OBJECT OF THIS STUDY is to investigate the relationship between the outlook of scientists on controversial nature-nurture problems and their attitudes toward social, political, and economic questions. If a close relationship is found to exist, then the question of causal relationships will be considered. There are several reasons for studying the relationship between the two stated variables.

First, many individuals assume, without adequate documentary support, the existence of such a relationship. Among those who have expressed such an idea are John Dewey (77; 78),[1] Herbert S. Jennings (139), Raymond Pearl (179), Lancelot Hogben (121), and John S. Brubacher. Brubacher's statement is typical:

> One is too likely to overlook the fact that the cleavage between heredity and environment, on the issue as to which is the more potent educational force, has a political as well as a scientific axis. Examination only too frequently will show that those with conservative political leanings emphasize the unmodifiable status of heredity, while the hope of the radical lies in an alterable environment where privileges can be redistributed. (30, p. 161.)

Second, a preliminary survey by the present writer of the scientific and social views of a number of psychologists, educators, and others, bears out such an interpretation (177). Finally, there is a rationale based upon an interpretation of historical trends, which suggests an inner relation between the two variables.

According to this rationale, the period in which the nature-nurture controversy became a prominent part of scientific investigation (after 1900) was marked by wide social and political

[1] The parenthesized numbers refer to numbered references in the bibliography.

changes. In America, for example, there was the muckraking movement; in England, there was the growth of the Labor party with its program of social reform. Generally, there was the rise of democracy and the growth of socialism. The philosophy underlying social reform is environmentalism—appropriate changes in institutional arrangements can bring about the elimination of "social evils" and make possible the attainment of desirable social goals. In this atmosphere of impending social change the position of the hereditarian would be to favor the *status quo* since he could contend that the essential incorrigibility of man's inherent nature was at the basis of social evils. Social evils could only be eliminated, from the point of view of the hereditarian, through appropriate changes in the innate characteristics of man. Further, it would be expected that vigorous supporters of environmentalism in science would be progressive with respect to proposed social changes. Environmentalism in science and emphasis on institutional factors with respect to social questions are both aspects of the same thought pattern. Consequently, this constitutes a logical basis for the above relationship. Since the science of heredity in relation to nature-nurture issues was in a relatively elementary stage, it was possible for the scientist to arrive at certain interpretations in accordance with the impact of the external social situation upon his frame of reference.

Importance of the Problem

The nature-nurture controversy is, in some ways, an agelong one. Plato and Aristotle, the perennial starting points of discussions in philosophy and psychology, expressed ideas which were based on some preconception regarding human nature and its possibilities in plans for an ideal society. Similar ideas formed a prominent part in the psychological and political discussions of the so-called *philosophes,* among whom may be mentioned Helvetius, Diderot, Rousseau, and Condorcet. In the modern period of the controversy, from 1859 onwards, the

ramifications have extended from the domain of science to that of social philosophy, sociology, education, philanthropy, and national and international politics. The specific content of these ramifications will be evident in the section dealing with the issues involved in the controversy and in the actual analysis of the twenty-four individuals who form the basis of this study.

Relevance of This Study

In addition to an evaluation of the stated relationship between the two variables under discussion, this study may provide a scheme for understanding divergent nature-nurture preconceptions and their apparently related concomitants. It should be borne in mind, in this connection, that the nature-nurture controversy is controversial in the sense that the relevant data do not permit a decisive formulation (as such formulations are traditionally conceived) in favor of either heredity or environment—a fact recognized by many. Barbara Burks, for example, wrote, "Nearly every study published in the field has been seized upon by both the hereditarians and the environmentalists and interpreted as favorable to the point of view of their own school." (31, p. 219.) [2] Since competent thinkers disagree in their interpretations, it will be assumed in this study that adherence by a scientist to a given inclusive interpretation (heredity or environment) represents an arbitrary judgment.[3] The factor determining adherence to a given position originates, then, in the value-system of the individual. Furthermore, the attempts of scientists to explain the origins of the two sets of divergent interpretations is another indication of the involve-

[2] However, "decisive" formulations were advanced by many participants in the controversy, emphasizing the all-importance of environment or heredity.

[3] This does not mean that scientific evidence is irrelevant to the formation of a judgment, nor does it mean that scientific research along the lines suggested by aspects of the controversy is futile. The accumulation of data may serve to delimit the scope of the controversy or to modify its application to other fields.

ment of a metascientific component in the controversy. Some scientists have written that emphasis on heredity represents the acceptance of a biological point of view, some have written that emphasis on environment represents the influence of humanitarianism, and one educator stated that the controversy represents divergent attitudes with regard to philosophical theories (53; 260; 284). In terms of this study, it may be that the controversy is essentially "sociological." It may then turn out that the solution to the nature-nurture controversy, as a controversy, lies in the manner in which scientific judgments are influenced by factors extraneous to the scientific situation. Before proceeding to a definition of the controversy, some possible historical and intellectual determinants will be outlined. For purposes of convenience these factors will be considered under the headings of intellectual, social, and logical.

Antecedents of the Problem

Intellectual.—John Locke's contribution of the *tabula rasa* doctrine to psychological theory has long been influential in the controversy. This doctrine has been interpreted as meaning that "all men are born equal" in their various characteristics, although Locke himself recognized the inborn component of human diversity (144). However, Helvetius interpreted the doctrine to mean that all men are literally born equal—surrounding conditions making them unequal (117). On the other hand, Diderot, a friend of Helvetius, criticized this view as an absurdity (79). Not a few psychologists of the present day, having interpreted *tabula rasa* to mean the literal innate equality of man, undertook to refute it by an appeal to the experimental data of biology and psychology (cf. 147).

Under the influence of Locke, the French school of *idéologues* fashioned a conception of human nature which has had a positive acceptance and an equally positive rejection by a host of thinkers—a conception which has become a permanent feature of contemporary political thinking by its inclusion, as a basic

principle, in the Declaration of Independence. Rousseau, for example, conceived of man in a "state of nature." In this primitive condition man was essentially good, unlike the naturally "brutish" and "nasty" man conceived by Hobbes. Consequently, the existing misery and depravity, according to Rousseau, was the result of the way in which society influenced man. If man were permitted to behave in accordance with his natural impulses, the result would be a good society. Rousseau was not so much concerned with the existence of individual differences (which he recognized) as he was with the rights of man.

The impact of Rousseau's views upon intellectual and social tradition, even in the late nineteenth century, was such as to call forth T. H. Huxley's polemic against the resurgence of "Rousseauism." Noting that

> "Liberty, Equality, and Fraternity," is still the war-cry of those, and they are many, who think, with Rousseau, that human sufferings must needs be the consequence of the artificial arrangements of society and can all be alleviated or removed by political changes. [132, p. 294.]

Huxley attempted to demonstrate that political inequality was the consequence of natural inequality.

As a reaction against the view, as expressed by Condorcet and Godwin, that human misery has its origin in institutional arrangements, Malthus reaffirmed the principle that misery is an aspect of the inevitable operations of the laws of nature. According to his theory of population, the number of individuals is always in excess of the means that Nature provides for its support. If the means of existence increases, its mode of increase is arithmetical, whereas the increase in population is geometrical. Consequently, a given portion of the population must of necessity live in poverty. War, famine, and other checks, are the natural means for the attainment of an equilibrium between the means of existence and the population.

Malthus' views had the far-reaching effect of suggesting the principle of natural selection to Darwin and Wallace, a debt

acknowledged by them. The Darwinian notions of natural selection, variability, and inheritance directly defined another line of influence upon the nature-nurture controversy, an influence brought into psychology by Galton. A special interpretation of Darwinian views in relation to society led to the movement called "Social Darwinism." Social Darwinism assumed that biological principles (natural selection in particular) were directly applicable to society, and as a consequence emphasis upon heredity was one of its conspicuous features. The success of Darwinism, in the face of wide opposition, popularized biological notions. This fact undoubtedly strengthened the tendency to apply Darwinism to disciplines not directly related to biology.

The putative applicability of the principle of natural selection to society was not in accord with civilized sentiment because it implied, to many minds, the acceptance of many unpleasant institutional features. From the point of view of Social Darwinism, infant mortality, the effects of disease, wars, the existence of slums, and so on, represented the unmitigated operation of the "laws of nature." (119.) The acceptance of this natural code, harsh to civilized minds, was facilitated by the rise of the Nietzschean ethic. This ethic was popularized in England and America after 1900 through the translation of Nietzsche's works and its adaptation to national issues (140; 162). It became a vehicle for denouncing the Christian ethic which was thought to be responsible for "sentimental" and "humanitarian" attitudes toward the unfit. The Christian ethic made possible the continued existence of the unfit when this was palpably contradictory to biological evolution. Philanthropic principles and the dissemination of medical and hygienic ideas were thought to be consequences of the Christian ethic. For example, Bateson, the English geneticist, thinking that interference with infant mortality "may be entirely wrong," proposed a new "medical ethics." (10, pp. 30 f.) The Nietzschean ethic, with its tolerant attitude toward harsh treatment of the unfit and sharp criticism

of the Christian ethic, facilitated the acceptance of the new biological code and its implications.

The biological conception of society received added emphasis through the popularity of racism. Racism located the problems of society, and the principle of its change, in the nature of particular races. De Gobineau, perhaps the first to espouse systematically a racist point of view, explicitly stated that environment was impotent to affect the hereditary equipment of man (74). Biological principles re-enforced the racist trend in that they led to the view that the various groupings of man were different "breeds" or "subspecies" which had evolved through the evolutionary process. It led to attempts to arrange the various groups of man linearly—the Negro being closest to the animal type and the Caucasians, the Nordics in particular, representing the highest type of development. To some psychologists it meant that criminals, the feeble-minded, the insane, and others, were distinct "subbreeds" of the human race (cf. 102).

In denial of the racist position was John S. Mill's widely quoted statement that

> Of all vulgar modes of escaping from the consideration of the effect of social and moral influences on the human mind, the most vulgar is that of attributing the diversities of conduct and character to inherent natural differences. (148, p. 20.)

Mill's eminence lent special weight to his opinions. But the biologically-minded had much to criticize in Mill's view, which seemingly was a reassertion of a naïve *tabula rasa* doctrine, that any "normal" person could attain his level of accomplishment by proper and early educational training (163, p. 21).

In contrast to the biological conception of society some individuals, among whom may be mentioned Buckle and Marx, expounded an environmentalistic doctrine. In explaining intellectual and moral progress, Buckle stressed the effect of the physical environment and the increasing control of man over organic and inorganic nature. Marx stressed the economic factor

in the interpretation of history and analysis of institutional phenomena. Marx's view was particularly controversial since he was the intellectual father of modern socialism. In answer to the biological point of view the socialists maintained that, however valid biological principles were for the lower animals, the social development of man was of a different order and, therefore, required its own principles of explanation (175).

The development of science, particularly of psychology, in the latter part of the nineteenth century, paved the way for the objective examination of nature-nurture issues. Objective psychology served as a focal point for such discussions since it was thought that the significant differences of mankind lay in the analysis of the mental characteristics of man. The development of mental tests as a technique of psychological research gave further hope in this direction. The development of genetics, roughly coinciding with the rise of psychology and based upon the rediscovery of Mendelian principles of inheritance, laid emphasis upon the role of genetic factors in the interpretation of mental and behavioral differences. The consequent discovery of genes and chromosomes as the carriers of heredity fitted well into the Mendelian quantitative scheme and doubtlessly served to emphasize the importance of hereditary factors.

Social.—The views of John Locke and the French *idéologues* were used to justify radical social and political reconstruction of society. The *idéologues,* for example, were the intellectual precursors of the French Revolution. The slogan of the revolution, "Liberty, Equality, and Fraternity," was an expression of their views. Some of them had a direct hand in drawing up the French constitution. Thomas Jefferson, who was influenced by the *idéologues,* drew up the Declaration of Independence with its doctrine of equality. This doctrine attracted the critical eye of many psychologists and biologists, and correspondingly, has received much support from social reformers. Critics questioned the scientific validity of this doctrine and pointed

out that it was at the basis of radical social and political activity. Furthermore, this doctrine was considered to be the ideology of the unfit (152, Chap. 4).

The Civil War in America focused interest on the racial problem. To some, the Negroes were natural inferiors and their treatment was intellectually justified on this basis. The social and political equality accorded them by the Constitution was not consistent with their supposed status as biological inferiors, and this conflict served to keep alive the Negro Problem. The dominance of this conflict in American tradition called attention to the possibility of measuring the mental status of the Negro when intelligence tests became available. Was there anything that science could offer in the way of determining his mental status and in this way help solve a perplexing national issue? A similar question arose with the necessity to deal with backward people in the colonization movements of the nineteenth century.

The social and political movements of the late nineteenth century and early twentieth century focused attention on the reasons for the existence of social evils and on the validity of the claims of various groups which sought social and political amelioration. The rise of socialism sharpened the issues involved. The general pertinent question involved the existence of some justification for social and political equality. A few of the specific questions were concerned with the extension of the franchise, feminism, pauperism, slum clearance, universal education, old-age pensions, labor legislation, crime statistics, and so on. In one way or another these issues became the concern of scientists and various answers were suggested. For example, one answer to the cause of poverty lay in the native inability of those poverty-stricken to adjust themselves to a competitive environment. Another answer to this issue placed the cause in social organization.

A common justification of social institutions in the nineteenth century was along religious lines. Society, it was thought, was the result of a Divine Will. The economic success or failure of

an individual was conceived as the preordination of God. The breakdown of the dominant religious patterns of defense, which was partly due to the general acceptance of the controversial Darwinian doctrine, paved the way for the acceptance of similar thought-patterns which were accorded the prestige of science. The idea of religious predestination, for example, could be replaced by that of "biological predestination." Bateson, in his address on heredity before the British Association of Science, asserted, as a fundamental biological fact, that the individual occupies a position in society which reflects his genetic worth. To this idea a member of the audience exclaimed, "Sir, you are preaching scientific Calvinism!" (9, p. 203.) [4] Galton, who experienced much difficulty in breaking away from religion, frequently spoke in terms of religious analogies in conveying his ideas on heredity. For instance, in discussing the notion that man differs as widely in natural characteristics as domesticated animals, Galton wrote:

> So it is with the various natural qualities which go towards the making of the civic worth in man. Whether it be in character, disposition, energy, intellect, or physical power, we each receive at our birth a definite endowment, allegorized by the parable related in St. Matthew, some receiving many talents, others few. (197, p. 227.)

Logical.—In view of the fact that the data of the controversy did not admit of a decisive interpretation, it was relatively easy to choose an interpretation without unduly offending scientific propriety, especially since the "taking of sides" in scientific disputes has been, in a sense, traditional among biologists and psychologists. Their subject matters were in constant change. Psychology, in particular, was always marked by severe conflicts. First, it fought to free itself of philosophical and theological domination. Then there were the many divisions, or "schools," of psychological thinking with different emphases

[4] An observation which Bateson thought was well phrased.

upon the goals and problems of scientific psychology. Functionalism, structuralism, behaviorism, and so on, represented divisions which were hotly contested (116). The assumption of a position on the nature-nurture controversy was thus well in accord with tradition in psychology.

The dominant status of dualisms in nineteenth-century thought, which cut across many fields, was another factor which contributed to a bifurcated outlook toward the data of the nature-nurture controversy. Some of the dualisms included: naturalism vs. supernaturalism, idealism vs. materialism, individual vs. society, science vs. religion, individualism vs. collectivism, mind vs. body, vitalism vs. mechanism, and so on. The twentieth century added another dualism, that of heredity vs. environment.

In summary: several influences, intellectual, social, and logical, contributed to the development of an atmosphere in which the nature-nurture controversy took root.

The Controversy Defined: Some Issues

The trend in psychology known as differential psychology, or psychology of individual differences, embraces many of the issues involved in the controversy. Measurements of individuals in a given population will yield variation in both mental and physical characteristics. For example, with regard to intelligence, genius and feeble-mindedness are variations equally removed from the average intelligence of the population, but in opposite directions. Under the notion of individual differences there can be subsumed the following: the gifted child, the subnormal child, the retardate in school, the accelerate in school, premature withdrawal from school, special disability in school subjects, the abnormal individual (psychotic and neurotic), and the criminal. Just as there are differences among individuals so there exist differences among groups. Under the heading of group differences in intellectual characteristics the following can be subsumed: sex differences, racial differences,

rural-urban differences, and nationality differences. The moot question concerns the origin of these differences among individuals as well as among groups. Are such differences the result of varying combinations of genetic or environmental factors? A less extreme question concerns the relative contributions of genetic and of environmental factors to the origin of these differences. Are prevailing differences predominantly the result of nature or nurture factors? With the advent of the mental test movement, the intelligence test has become the common means of measuring intellectual variations. The index of measurement is the intelligence quotient. The objectivity of intelligence tests and their wide usage have made them the focal point for discussion on size and cause of variations. These discussions have centered in the notion of "constancy of I.Q." Constancy of I.Q. conveys the idea that intellectual differences are genetically determined. Efforts to show that the I.Q. is sensitive to environmental changes have characterized the position of the environmentalists. It has been contended, for example, not without heavy criticism, that an advantageous environment can raise the I.Q. from the normal range to the genius level. Such changes have been reported by the Iowa group headed by George D. Stoddard (218). Investigation of the claims of the Iowa group led to the two volumes of research reports in the 1940 Yearbook of the National Society for the Study of Education (171).

Natural selection is the complementary concept to that of individual variation. In biology, natural selection is the agency through which variations, exhibiting varying degrees of adaptation to the environment, are selected or rejected for survival by the environment. To make the concept of natural selection applicable to man, the idea of environment was extended to include social and economic factors. Success or failure in this social and economic environment now measured the genetic fitness of the individual. In education it was applied to the small percentage completing their high-school education and to the

still smaller percentage completing college. Those dropping out at various stages of the educational system represented the failures who could not successfully compete, in the academic environment, with those endowed with superior innate ability. Education was like a sieve—it held on to those with superior ability without essentially modifying them in any particular way. This was an extreme position but, nevertheless, it received explicit statement. Competition of individuals in the socioeconomic environment, it was maintained, produced the class stratification of society. The superior showing of the upper classes in intelligence (with respect to the findings of intelligence tests) and in actual achievement was thus regarded as a manifestation of innate superiority. The argument of selection was also used to explain the superiority of the city over the country, of one state over another, and of the Northern states over the Southern states. The application of natural selection to society, however, did not receive universal assent. Critics argued in favor of the potent role of educational, social, and economic forces in determining the success or failure of an individual in society, regardless of his innate capacity. The extent to which natural selection was thought to operate in society formed another aspect of the nature-nurture controversy.

The doctrine of instincts was another trend in psychology which served as a lever for nature-nurture discussions. Was the behavior of the individual, qua individual, and as a member of society, the natural result of innate impulses and patterns? Was criminality the result of a "criminal instinct" or of social organization? Was the mother affectionately disposed to the infant by virtue of innate disposition or social custom? Was the striving for wealth the result of an "acquisitive instinct" or a characteristic of a "competitive society"? These were a few of the many questions that stimulated thinkers while the doctrine of instincts was in full swing (from 1905 to 1920, roughly speaking).

Definitions Concerning the Scientists

The foregoing brief description of the elements of the controversy makes it possible to define the way in which the terms "hereditarian" and "environmentalist" can be used as descriptive devices. Although these terms are part of the vocabulary of psychology and education, no precise definitions have been set forth. None will be attempted here except denotatively. It should be mentioned that the division of individuals into the hereditarian or environmentalist camp, in so far as a definite position is maintained, is already structured. That is, authorities generally agree in their classification of the chief participants in the controversy.

Hereditarian.—A hereditarian is one who accepts statements of the following type: heredity is more important than environment; individual and group differences are the result of innate factors (either in totality or predominantly); innate characteristics are not easily modified. Where a choice of interpretation is possible, the explanation in genetic terms is the one advanced and favored. To the hereditarian way of thinking, the problem of differential fecundity looms as a most significant one for society.

Environmentalist.—An environmentalist is one who accepts statements of the following type: environment is more important than heredity; existing individual and group differences reflect (much more than is commonly thought) differences in opportunity; innate characteristics are easily modified. Furthermore, the "plasticity" of the child is emphasized. Of possible alternative interpretations, he chooses the one emphasizing environment. In addition, the environmentalist minimizes the importance of natural inequalities in the attainment of success and rejects the eugenic program (as usually conceived).

It should be mentioned that a particular classification does

not deny the effects popularly subsumed under the other classification. The environmentalist classification does not imply that hereditary effects are denied. Similarly the hereditarian classification does not imply that environmental effects are denied. The relevant point concerns the emphasis of the individual on matters of controversy. Fuller meaning of these terms will be accorded in the course of this study.

Conservative, liberal, radical.—The following factors were considered in determining the classification of an individual: attitude toward the potentialities of the "common man"; attitude toward democracy; attitude toward social reconstruction; attitude toward origin of social evils. The term "conservative" is applied to an individual who is pessimistic with regard to the potentialities of the average person or who is critical of attempts to broaden the participation of the citizenry in governmental affairs. Acceptance of the *status quo* is also taken as indicative of a conservative orientation. The "liberal" is characterized by a belief in the necessity of change, and by the fact that he is favorably disposed toward the possibilities of the average man and toward the democratic concept. The "radical" is marked by a belief in the necessity of thoroughgoing change in social, political, and economic institutions.

It is recognized that these definitions may be at variance with those proposed by other individuals. There is an arbitrary element in all definitions and the justification for particular definitions rests in their serviceability in systematizing ideas. This pragmatic criterion seems to have been useful in this present study. In any case, it is hoped that there is a sufficient generality to these definitions to warrant some measure of common acceptance.

Method of Verification

This study is limited to a selection of twenty-four American and English scientists prominent in the nature-nurture con-

troversy in the period 1900 to 1940. Some of these scientists exerted their major influence in the period 1900 to 1918, the others in the period 1919 to 1940. This division is by no means a rigid one since a few individuals cut across both periods. In no way do the selected individuals represent a statistical sample of all individuals active in the controversy. Individuals were selected because of their significant relationship to the nature-nurture controversy either by way of initiating different points of view or by furthering research along particular lines. Only those individuals who expressed themselves on both nature-nurture issues and controversial social and political questions were considered for selection. There were many individuals who had definite positions on the nature-nurture controversy but who were silent on their social and political views—a fact more characteristic of the period 1919 to 1940. However, those individuals who could be called "leaders" or "pioneers" in the controversy were usually the ones who asserted explicit views concerning the social order. The specific nature of socio-economic expression was not involved in deciding whether any particular individual was to be excluded or included. The twenty-four individuals selected were drawn from a pool of over two hundred names—a pool that was built up as the study proceeded.

Two factors were considered in determining the classification of an individual with respect to his emphasis on nature or nurture. First, the statement of authority was given consideration inasmuch as competent judges have already referred to many of the participants in the controversy as belonging either to the hereditarian or to the environmental school. Second, the relevant writings of each individual were studied in order to obtain explicit statements of his point of view. Frequency of citation in the nature-nurture literature was the chief criterion for determining the relevance of a bibliographical item. All cited writings were examined or studied. Since the method of proof in this study depends largely on quotations, care was

taken to see that such selections of materials were typical and in accord with the author's intent in the given passage or work. The cited quotations are intended to typify a particular point of view. They are not meant to be representative of the total expression of an individual. In some cases, however, particularly in so far as socioeconomic issues were involved, quantity of expression was limited and, therefore, the quotations practically represent the author's total expression.

For determining a classification on the nature-nurture controversy the following factors were kept in mind: explicit statement of point of view as set forth, for example, in the definitions of hereditarian and environmentalist; possible partiality in drawing conclusions from individual's own investigation; possible partiality in accepting or rejecting relevant data; individual's conception of aims and possibilities of a given investigation.

To determine classification with regard to attitudes toward controversial social, economic, and political questions, the various factors which were discussed in the definitions of terms were kept in mind. Throughout the course of this study, emphasis has been given to the individual's awareness of the interrelatedness between his position on the nature-nurture controversy and his position on socioeconomic issues. A marked degree of interrelatedness would serve to suggest that any ascertainable relationship between nature-nurture position and social outlook is a dynamic one.

The following individuals were selected (the dates denote the period of dominant influence):

English

Francis Galton, psychologist, 1900–18
Karl Pearson, statistician, 1900–18
William Bateson, geneticist, 1900–18
William McDougall, psychologist, 1900–40 [5]

[5] It is to be noted that McDougall really should be included in both

English (Continued)

Lancelot Hogben, geneticist, 1919–40
J. B. S. Haldane, geneticist, 1919–40

American

Charles B. Davenport, geneticist, 1900–40
Frederick A. Woods, biologist, 1900–18
Edward Lee Thorndike, psychologist, 1900–40
Henry H. Goddard, psychologist, 1900–18
Lewis Madison Terman, psychologist, 1900–40
Paul Popenoe, biologist, 1900–40
Leta S. Hollingworth, psychologist, 1919–40
Edward M. East, geneticist, 1919–40
Lester F. Ward, sociologist, 1900–18
Charles Horton Cooley, sociologist, 1900–18
James McKeen Cattell, psychologist, 1900–18
Franz Boas, anthropologist, 1900–40
William C. Bagley, educator, 1919–40
Herbert S. Jennings, biologist, 1919–40
Hermann J. Muller, geneticist, 1919–40
Frank N. Freeman, psychologist, 1919–40
George D. Stoddard, psychologist, 1919–40
John B. Watson, psychologist, 1919–40

The selected individuals comprise ten psychologists, nine geneticists and biologists, two sociologists, one anthropologist, one educator, and one statistician. This classification is by no means a rigid one since the field of activity of a scientist may extend over several areas. Galton, for example, could be classified with equal justice as a biologist or a statistician. The center of interest in this study is education and psychology.

Some of the many individuals who were considered for inclusion in this study but who were rejected are: Alfred F. Tredgold, Leonard T. Hobhouse, Cyril Burt, Leonard Darwin, R.

England and America since he left England in 1920 for permanent residence in America. His inclusion in the English group is justified by the fact that McDougall had clearly formulated his views before 1920.

Ruggles Gates, Edwin MacBride, Barbara S. Burks, Florence L. Goodenough, Edward G. Conklin, G. Stanley Hall, John Dewey, George M. Whipple, Carl C. Brigham, Robert M. Yerkes, Samuel J. Holmes, Edgar J. Swift, L. L. Burlingame, Edward A. Hooton, and Montagu F. Ashley-Montagu. These individuals were rejected for a variety of reasons. Some were rejected because they did not express themselves sufficiently extensively to make their inclusion worthwhile. Others were rejected because their positions were quite similar to those who have already been discussed. It should be added that the basis for rejection of these individuals was independent of their sociopolitical outlook.

It should be noted that a possible source of error in the method of this study, in addition to errors of sampling and judgment, lies in the fact that it is limited to the written productions of individuals. The processes which lead individuals to express themselves in writing—processes which may be conceivably related to their expressed attitudes—are quite unknown.

Part Two

THE SCIENTISTS

FRANCIS GALTON *1822–1911*

FRANCIS GALTON, the progenitor of the nature-nurture controversy in its scientific aspects, occupies a unique position in the history of modern psychology. Trained in medicine, he distinguished himself as an explorer, geographer, and meteorologist. Influenced by Darwin's *Origin of Species*, his attention turned to ethnographical and biological problems. Galton's scientific aims centered in the exposition of Darwinian notions, especially those of variation and natural selection. His continued interest in biology was strengthened by his personal acquaintance with Herbert Spencer and T. H. Huxley (195, p. 62).

Having adopted the evolutionary framework of thought, Galton advocated a naturalistic view of the mind at a time when theological influence was strong in psychology. In addition to his naturalism, Galton emphasized measurement and experimentation. He was the first experimental psychologist in England, following closely the precedent established by the German psychologists. He extensively explored the psychology of individual differences in its intellectual, emotional, and characterological aspects. This field of interest led to an important branch of psychological thought. His contributions to psychology included specific advances in methodology, such as the use of the questionnaire in the study of mental traits and the twin-method in the study of nature-nurture questions. His doctrines influenced a generation of psychologists, both in Europe and in America. An important tool discovered by him was the correlation coefficient which, developed by his follower Karl Pearson, helped form the basis of modern statistics.

In biology Galton was the first to place the concept of he-

redity on a statistical basis. Furthermore, he anticipated Weissmann's notion of mutation. His laws of ancestral inheritance and filial regression are well known. He contributed to anthropology through his investigations on race and through his presidency, for many years, of the Royal Anthropological Institute of Great Britain and Ireland. Not content with these scientific contributions, Galton devoted the last decade of his long life to the development of the eugenics movement, which he founded. He wrote and lectured extensively on eugenic doctrines and helped establish the Eugenics Education Society in 1908, a society of which he became the first honorary president. He attempted to give eugenics a scientific standing by founding, in 1906, the Galton Laboratory of National Eugenics at the University of London, with Karl Pearson as director. He further contributed to the growth of the eugenics movement by endowing a chair in eugenics which was occupied by Pearson until 1933. Partly as a result of Galton's efforts, the eugenics movement became one of the distinctive intellectual and social trends at the beginning of the twentieth century.

Although there were two distinct aspects to Galton's work, scientific and practical, the practical side of his thinking (eugenics) directed the course of his scientific endeavors after he switched from geography to biology (98, p. 3). The ideas of eugenics are clearly evident in his writings as early as 1864, and form a conspicuous part of his first book, *Hereditary Genius* (1869). Galton realized that in order to popularize eugenic ideals it was necessary to establish a science of heredity. Galton thought it desirable to popularize eugenic ideals so as to give them a decisive role in human affairs. For this purpose he thought it necessary to establish a science of heredity and this would account for the importance that Galton attached to the concept of heredity.

It is well known that Galton's prevailing emphasis was on heredity. To his way of thinking, "heredity was a far more powerful agent in human development than nurture." (100,

p. 266.) Throughout his scientific works Galton included the total range of intellectual, moral, emotional, and other qualities, as outcomes of innate factors. Specifically, this range included statesmanship; pious disposition; judiciary, scientific, musical, and literary abilities; criminality; insanity; "civic worth" and "civic prosperity." Galton's emphasis on heredity can be inferred from a brief consideration of some of his books (cf. 93; 96).

In his first book, *Hereditary Genius*, Galton demonstrated that natural ability followed family lines and that eminent families were interrelated. In this vein, he studied the family background of judges, military commanders, painters, divines, and so on, and showed that abilities were associated with particular family lines with a frequency much greater than chance. These "gifts" he interpreted as outcomes of innate factors. Extending this analysis, he attempted to show that superior ability followed national and racial classifications. The notions underlying his methodology were the Darwinian ideas of variation, natural selection, and inheritance. From this point of view, individuals differ vastly in their intellectual and moral faculties. In the competition to win the relatively few prized positions awarded by society, those who are endowed with superior faculties succeed. The successful ones transmit their endowment to their offspring, and this establishes the basis for the expectation that natural ability follows family lines. In order to obtain some measure of the intrinsic worth of an individual, Galton utilized the principle that achievement is a fair test of natural ability. A corollary of this principle is that an unfavorable environment can not suppress a man of genius. In stating these views, Galton wrote:

> By natural ability, I mean those qualities of intellect and disposition, which urge and qualify a man to perform acts that lead to reputation. . . . I mean a nature which, when left to itself, will, urged by an inherent stimulus, climb the path that leads to eminence, and has the strength to reach the summit—one which, if hindered or

thwarted, will fret and strive until the hindrance is overcome, and it is again free to follow its labour-loving instinct. . . . It follows that the men who achieve eminence, and those who are naturally capable, are, to a large extent, identical. (93, p. 33.)

A few pages later he stated, "I argue, that, if the hindrances to the rise of genius, were removed from English society as completely as they have been removed from that of America, we should not become materially richer in highly eminent men." (93, p. 36.)

Galton also phrased these views in a statistical language, for he contended that the proportion of eminence in a modern population is a constant figure, 250 per million. On the basis of his contention that the incidence of eminence in a population reflects the innate capacity of the people Galton rated the ancient Greeks as much superior to modern Europeans. Similarly, in a comparison between the whites and Negroes, he held that the Negroes constituted a "sub-race." (93, pp. 325 ff.)

Galton's formulation of a theory of the rise and fall of civilizations presupposes the same contention. Civilization, he maintained, is adapted to the hereditary capacities of the individuals composing it. A decline, or rise, in the innate qualities of a people is accompanied by corresponding changes in institutions. Conversely, long-range changes in the structure of society are indicative of changes in the innate qualities of the population. This theory came to be a favorite theme among eugenists. In expressing a mood of pessimism, Galton wrote that man is incapable of sustaining the burden of a modern complex civilization. Improving the "breed" of man thus became an urgent necessity (93, pp. 338 ff.).

These ideas, set forth in his *Hereditary Genius*, formed the basic framework for his later thinking. In his *English Men of Science: Their Nature and Nurture* (1874), which was written as a reaction to De Candolle's *Histoire des sciences et des savants depuis deux siècles* (1873), he concluded that men of science owed their position to an "innate taste" for science, in addi-

tion to their natural ability. In this book, however, he did recognize that environmental factors, such as encouragement at home and schooling, might mold a taste for science. His hereditarian bias is evident in the interpretation of his basic finding that the parents of the men of science were practically all drawn from the professional and leisured classes. This led to his interpretation that

> There can be no doubt but that the upper classes of a nation like our own, which are largely and continually recruited by selections from below, are by far the most productive of natural ability. The lower classes are, in truth, the "residuum." (95, p. 23.)

Galton's emphasis upon heredity is paramount in the formulation of his eugenic doctrine, which is predicated on the idea that "race is more important than nurture." Evolution and the principle of natural selection implied continuous progress to Galton. But modern civilization prevented the principle of natural selection from operating with full force, as in Nature, and, consequently, Galton predicted the decline of civilization. In fact, Galton saw evidence of deterioration when he compared the physiques of individuals at the seashore with those in factory towns. Recognizing that modern sentiment, with its emphasis on humanitarianism, would not permit a return to unmitigated natural selection, Galton proposed a system of artificial selection (eugenics) as a substitute. According to this view the superior individuals of a population should be encouraged to intermarry and breed numerous offspring, thus forming a "gifted class" or "Caste" (94). Likewise, those of inferior variations should be prevented from marrying by the weight of community sentiment or by "stern compulsion." In this way a high type of "human breed" would be secured and the upward progress of civilization accelerated. The idea of race improvement by means of artificial selection should become, according to Galton, a "religious tenet." Eugenics, he maintained, could well supplant the established religions. To this end, it was necessary to

develop a science of heredity and to disseminate knowledge of heredity to the general public. In this way the principles of heredity could become an unquestioned guide to human conduct. The Eugenics Education Society was established with these ends in view. In elaborating his views, Galton gave occasional recognition to the influence of environment despite his usual emphasis upon heredity.[1] The effect of the eugenic idea upon Galton was such that it led him to write an unpublished book in which he envisaged a Utopian society, "Kantsaywhere," based exclusively on eugenic principles (197, pp. 411 ff.).

Galton's views on heredity and eugenics received wide attention, particularly after 1900, and formed the basis of the thinking of his followers in these matters, who are sometimes identified as the "Galton School." In psychology his followers included Karl Pearson, William McDougall, Lewis M. Terman, Edward L. Thorndike, and others. All the hereditarians considered in this study show the influence of Galton.

Galton's views, however, did not meet with universal acceptance. Among his critics were D. G. Ritchie, Leonard T. Hobhouse, Charles Horton Cooley, James McKeen Cattell, and others. An argument usually advanced by these critics dealt with the validity of Galton's basic contention that achievement was a fair measure of genetic worth. Thus, Cooley, in answering Galton's *Hereditary Genius*, argued that not all men of superior ability achieve success or fame. Historical and social conditions determine which men of superior ability are to succeed or fail. He also criticized Galton's theory of civilization as "ad hoc." (61.) From the point of view of present-day science, the general incorrectness of Galton's position is demonstrated by his own data. In his various studies of eminence the

[1] In stating these views, Galton was not as extreme as some of his followers, for he did admit the necessity of correcting "insanitary conditions" for purposes of elevating the race. In 1906 he went as far as to state that Eugenics had the "two-fold meaning of good stock and good nurture." (197, p. 310.) But this was atypical.

achievement of the female sex was negligible, even within the same families in which the male members were eminent. Galton's unfavorable attitude toward the potentialities of women might have been responsible for overlooking this fact (197, p. 232).

Galton rarely expressed himself on specific social and political issues. On the few occasions that he did, his views seemed to be conservative in nature. Thus, he was opposed to the idea of "strikes" and to an increase of the "Irish vote." (198, p. 615.) He was a committee-member of an "Anti-Suffrage" society, a fact which caused some distress to the female colleagues of Pearson (197, p. 359). His general position has been interpreted as "anti-democratic." [2]

Galton early conceived of eugenics as a social reform movement, as a reasonable alternative to the then existing plans for reconstructing society (197, pp. 90 f.). This notion received further emphasis in 1894 in a review of Kidd's *Social Evolution*, in which Galton presented eugenics as an alternative to socialism (97). A letter from Pearson to Galton in 1901 exhibits a similar emphasis on the political aspects of eugenics. In this letter Pearson raised the question, "Heredity, is really more intense than we supposed it to be ten years ago. Cannot this be brought forcibly home to our rulers and social reformers?" He then continued:

> What then it seems to me we mostly need at the present time, is some word in season, something that will bring home to thinking men the urgency of the fertility question in this country. There is no man who would be listened to in this matter in the same way as yourself. You are known as one who set the whole scientific treatment of heredity going; no one has ever suspected you of being in the least a "crank," or having "views" to air. You will be listened to and it will be recognized that you write out of a spirit of pure patriotism. (197, pp. 242 f.)

[2] For instance, E. B. Reuter, the American sociologist, in a presentation and discussion of the thesis of Galton's *Hereditary Genius*, asserted that it was "powerful anti-democratic material." (209, p. 418.) Galton, however, did not explicitly state any antidemocratic conclusions.

Possibly as a result of this suggestion from Pearson, Galton's activities in popularizing eugenic doctrine were increased, not without stated social and political implications (cf. 98). Galton's lecture on this subject before the newly formed Sociological Society (1905), in which he described measures to be taken to organize society along eugenic lines, was criticized by some members of the audience as a social and political program (99, pp. 72 f.).

The eugenics program, as Galton conceived it, was based upon the idea that the present capacities of the average man were too low to guarantee the operation of a society free from evil. He wrote:

> Our present natural dispositions make it impossible for us to attain the ideal standard of a nation of men all judging soberly for themselves, and therefore the slavishness of the mass of our countrymen, in morals and intellect, must be an admitted fact in all schemes of regenerative policy. The hereditary taint due to the primeval barbarism of our race, and maintained by later influences, will have to be bred out of it before our descendants can rise to the position of free members of an intelligent society. (96, p. 56.)

The desire to improve the human race need not have conservative implications, but to Galton it did have such implications.

> My proposition certainly is not to begin by breaking up old feeling of social status, but to build up a caste within each of the groups into which rank, wealth and pursuits already divide society, mankind being quite numerous enough to admit of this sub-classification. (94, p. 123.)

That this was not simply an academic point with Galton is evident in the concluding pages of his *Inquiries into the Human Faculty*. Man, he urged, as "heir of untold ages," should pay more attention to directing the course of his evolution. Galton's dominant attitude was that eugenic measures provided the most effective solutions for social and economic problems.

The postponement of the settlement of the major problems confronting society, deemed urgent by many, to a time when a "superrace" may be bred represents a distinct bias in favor of

the *status quo*. Furthermore, the underlying assumption that the ills of society are the result of an inadequate human nature, intellectually and morally, diverts attention from the possible responsibility of society in such matters and thus similarly represents a conservative bias.

With regard to the concept of democracy, Galton thought that it was incorrect in so far as it assumed that men were of "equal value as social units, equally capable of voting, and the rest." (196, p. 121.) Democratic sentiment, he thought, would also be opposed to the breeding of a "gifted class" and the consequent presumption of the control of the state by this class (94, p. 129). Since Galton expressed himself on the democratic concept only by indirection, we quote Pearson's estimate of Galton:

> Democracy—moral and intellectual progress—is impossible while man is burdened with the heritage of his past history. It has bound mankind to a few great leaders; it has produced a mass of servile intelligences; and only man's insight—man breeding man as his domesticated animal—can free mankind. This was Galton's view. (195, p. 74.)

In brief, Galton may be classified as a hereditarian, despite some recognition of the weight of environmental factors, and as a conservative with regard to sociopolitical outlook.

KARL PEARSON *1857–1936*

THE SCHOLARLY CAREER of Karl Pearson, the eminent English statistician, reveals a number of aspects: (*a*) early interest in social questions, (*b*) early interest in science and applied mathematics, (*c*) quantitative approach to problems of evolution, (*d*) pragmatic orientation of his thinking, (*e*) polemical attitude to individuals with opposing theories and interpretations. Karl Pearson exerted a lasting influence upon science, especially psychology, by his exposition of Galton's doctrines, his many statistical innovations, his experimental approach to the problems of heredity and environment, and his vigorous emphasis on nature factors. As a pupil of Galton, he shared Galton's bias in favor of Social Darwinism. Pearson's extension of biological principles to the problems of society was not unnatural in view of the fact that he attained intellectual maturity in the period of the great Darwinian controversy. To psychologists and educators Pearson's name is associated with the correlational approach in the attempt to compare quantitatively the importance of heredity and environment.

Karl Pearson's general aim in his scientific work was determined, according to his own statement, by his belief that science should be conducive to social and national stability. An early expression of this attitude was given in 1887 when he wrote:

> There are powerful forces at work likely to revolutionize social ideas and shake social stability. It is the duty of those, who have the leisure to investigate, to show how by gradual and continuous changes we can restrain these forces within safe channels, so that society can emerge strong and efficient again from the difficulties of our 19th century Renascence and Reformation. (185, Preface.)

The same view formed the basic theme of his lecture on "National Life from the Standpoint of Science." (1900.) In this lecture he expressed serious concern over Great Britain's "defeat" in the Boer War "by a social organism far less highly developed and infinitely smaller than our own." (187.) He predicted a conflict with Germany because of commercial and trade rivalries, and he felt that it was his duty, as a man of science, to indicate the way in which the teachings of science could strengthen Great Britain for such "contests." He also indicated the type of knowledge that would be essential for a correct determination of national policy. To this end he strongly advocated the concept of natural selection.

> You will see that my view—and I think it may be called the scientific view of a nation—is that of an organized whole, kept up to a high pitch of internal efficiency by insuring that its numbers are substantially recruited from the better stocks, and kept up to a high pitch of external efficiency by contest, chiefly by way of war with inferior races, and with equal races by the struggle for trade-routes and for the sources of raw material and of food supply. This is the natural history view of mankind, and I do not think you can in its main features subvert it. (187, p. 46.)

The pervasiveness of Karl Pearson's pragmatic conception of science is further indicated by his acceptance in 1911 of the professorship in eugenics established by Galton, a position which he held until 1933. Much of his own research work, as well as that of his colleagues, was subordinated to the various issues raised by the eugenic point of view.

Convinced that the proper estimation of the importance of nature and nurture factors was intimately related to the scientific settlement of social and political issues, Pearson undertook various investigations which led him into many disputes with scientists and reformers. His chief contribution to the nature-nurture controversy was his study, *On the Laws of Inheritance in Man* (1904). His object in that work was to seek a quantitative measure of the inheritance of "mental and moral characters in man." Comparisons between the physical characteristics of

parents and offspring gave an average correlation of approximately 0.50. A similar average correlation was obtained with regard to mental and moral characteristics. Pearson maintained that, since it was known that the physical characteristics he dealt with were little influenced by environment, mental and moral characteristics were probably determined by hereditary factors. In concluding this study, he wrote, "We inherit our parents' tempers, our parents' conscientiousness, shyness and ability, even as we inherit their stature, forearm and span." (186, p. 156.) By this reasoning, Pearson brought forth evidence to indicate that intelligence, conscientiousness, health, and many other traits were determined by hereditary factors (cf. 186). His hereditarian position is perhaps tersely summed up in the statement, "Intelligence can only be bred and no education or training can create it." (186, p. 160.) Thus, on the basis of his researches Pearson does not attach any importance to the environment in producing differences among individuals.

In some ways Karl Pearson, as a thoroughgoing hereditarian, was the defender of unpopular causes. Established medical opinion, he wrote, attached sole importance to the tubercle bacillus as the cause of tuberculosis. He felt that the "Fight Against Tuberculosis" movement in Great Britain was misconceived because of its environmentalist stand. In setting off his own views, he wrote:

> The line usually taken by these protagonists in the fight against tuberculosis is that tuberculosis is an essentially infectious disease, that heredity plays no part in the matter, that a great drop in the prevalence of tuberculosis has already taken place, and that this drop is due to sanitary precautions. . . . Dr. Newsholme even tells us that in his opinion there is "no reason why, within a relatively short period, tuberculosis should not follow the closely allied disease of leprosy towards extinction." (190, p. 3.)

In contradistinction to this view Pearson attached all importance to innate factors. One argument he cited was a correlation of 0.50 between parents and offspring with regard to tubercular infection which is "precisely that which we find for

other characters where the relationship is due to heredity." (190, p. 14.) Another argument was the fact that most people are infected by germs at one time or another, but not all succumb. The factor of "resistance," which was considered to be a heritable factor, was, according to Pearson, "of more importance than the infection alone." (190, p. 27.) Carrying his thinking to its extreme, he questioned the efficacy of sanatoria in prolonging or saving lives since no statistical demonstration of their worth was forthcoming. As a means of decreasing the incidence of tuberculosis, Pearson evidently accepted the processes of natural selection. He wrote, in concluding his monograph on the subject:

> It may be a bitter pill for mankind to swallow, when we suggest that natural selection may have done more for racial health in this matter than medical science, but it may have its compensations from the economic standpoint. Above all, it may suggest that Evolution helps man better than he at present knows how to help himself, and that possibly he would learn to help himself better if he studied her processes of racial selection a little more closely. (190, p. 35.)

Natural selection achieves its result by eliminating those who are "non-immune" to the disease, leaving behind a racial stock which is "more resistant and immune." It was in this way that Pearson explained the constant drop in the tuberculosis rate from the middle of the nineteenth century to the present.

Another investigation of the Eugenics Laboratory which led to a bitter controversy was Pearson's study dealing with the statistical evaluation of the effects of parental alcoholism upon offspring. At the time it was thought by some scientists that parental alcoholism was responsible for the intellectual dullness of offspring and for the low quality of the home environment. Pearson's results were negative; they indicated that alcoholism had no demonstrable effects on intelligence or other characteristics of offspring. Controversy over the validity of these conclusions carried into the London *Times*. This controversy almost led to Galton's resignation as honorary presi-

dent of the newly formed Eugenics Education Society, since the president of this society had openly criticized the conclusions in a manner that was thought to be prejudicial to the growth of the eugenics movement. The "Cambridge Economists," John M. Keynes and Alfred Marshall, also assailed Pearson's investigation. This in turn led to a spirited reply by Pearson to the "Cambridge Economists." (189.)

Two questions with regard to Pearson's work will now be considered: (*a*) Were Pearson's conclusions generally justified on the basis of his data? (*b*) If not, was the direction of logical error consistent with his general position? Pearson's investigation dealing with the mental and moral qualities of immigrants into Great Britain will provide the answers to these questions. This investigation was begun before 1908 and some of the results were published for the first time in 1925.[1]

In 1905 the question with regard to the quality of the racial stock immigrating into Great Britain received much discussion. Pearson was expressing a common attitude of the time when he wrote:

> The whole problem of immigration is fundamental for the rational teaching of national eugenics. What purpose would there be in endeavouring to legislate for a superior breed of men, if at any moment it could be swamped by the influx of immigrants of an inferior race, hastening to profit by the higher civilization of an improved humanity? (194, p. 7.)

In presenting the historical background for the selection of a particular alien group for analysis, he wrote:

> In the years preceding the Great War a question of indiscriminate immigration—especially that of the Polish and Russian Jews into the East End of London, and the poorer quarters of other larger towns in Great Britain—had become a very vital one. It was asserted on the one hand that the immigrants were a useful class of hard workers fully up to the level of the English workman in physique and intelligence, and on the other hand these immigrants were painted in lurid colours as weaklings, persons with a low standard of life and

[1] Margaret Moul was coauthor in these published reports.

cleanliness, underbidding native workers in sweated trades and spreading anarchic doctrines, so that the continued inflow of this population was leading not only to economic distress, but to a spread of doctrines incompatible with the stability of our social and political systems. (194, p. 7.)

Pearson added that facts were necessary in order to determine the truth of the various assertions. It is important to note that, according to Pearson's own statement, these immigrants were selected not "because they were Jews, but because they formed a large and accessible body of immigrants who could be worked relatively easily from one centre" and for the further reason that "over them the fight waxed hottest." (194, p. 8.)

The plan of the study was simple: a group of Jewish boys and girls (typifying alien stock) and a group of Gentile boys and girls (typifying native stock) made up the experimental samples. Various measurements of both groups were taken, involving intelligence, cleanliness, and physique. Following the plan of his study of 1904 which utilized pre-Binet methods, intelligence was rated by teachers on a seven-point scale. Comparisons were instituted. On the basis of these comparisons Pearson concluded that the Jewish group was not of a higher intelligence than the Gentile group, and that the Jewish group was inferior in physique and somewhat dirtier (194, pp. 47 f.). In reference to the determination of national policy on immigration, it was concluded that "the welfare of our own country is bound up with the maintenance and improvement of its stock, and our researches do not indicate that this will follow the unrestricted admission of either Jewish or any other type of immigrant." (194, p. 127.)

There are some important defects in the data that vitiate all comparisons between the Jewish group and the Gentile group with regard to intelligence.

First, in estimating the intelligence of his groups, the criterion was the judgment of teachers who indicated a rating based on a seven-point scale. By this method it was found that there were

marked average differences between the intelligence of Jewish boys and of Jewish girls, the boys being considerably more intelligent. (In this connection no sex differentiation was found in the Gentile group.) Pearson then proceeded to make separate comparisons for boys and girls throughout the discussion. Instead of taking this sex difference as an indication of possibly faulty data, the authors framed an admittedly speculative hypothesis to explain this fact, a hypothesis involving differential selection of immigrants from Europe. Present-day psychologists, however, would reject any analysis that treats boys and girls as two distinct groups with regard to average level of intelligence.

Second, in comparing the Jewish group with the Gentile group, sex by sex, it is observed that the differences between the Jewish boys and the Gentile boys are insignificant—differences only emerging when Jewish girls are compared with Gentile girls. This fact, which invalidates a comparison between Jewish and Gentile groups as groups, was not explicitly stated. Its recognition, however, was implied in the statement of the conclusion that "*taken on the average*, and regarding both sexes, this alien Jewish population is somewhat inferior physically and mentally to the native population." (194, pp. 125 f.)

Similar comments apply to the comparisons drawn between the two groups with regard to cleanliness. Furthermore, probably owing to eugenic zeal and patriotic sentiment, the conclusions and interjected comments involve an unscientific component. For example, after concluding that the Jew is "dirtier," he stated that

> It does not seem to us that there can be any doubt as to the inferences to be drawn from these results, especially when we remember that personal cleanliness of the children is largely a measure of parental standards in these matters. *The standard of the Jewish aliens in the matter of personal cleanliness is substantially below that of even the poor Gentile children.* The full gravity of this result will only be realized when we remember how vitally important it would be, if London were struck by a great epidemic. (194, p. 47.)

Nowhere does Pearson allude to the possibility that the slum environment of the Jewish children may have determined their personal habits. This point is significant because the Gentile children did not come from slum areas. Since Pearson's discussion presupposed a racial point of view, his results were undoubtedly meant to support this point of view. Thus, it was suggested that Jews as a race tend toward radical doctrines and city life (194, p. 22).

Pearson thought that the only desirable immigrant group was one that could raise the English racial level. He proposed, therefore, that such an alien group should be, on the average, 25 per cent "higher" physically and mentally than native stock in order to be admitted into Great Britain. If Pearson's purpose was to show that the Jewish immigrant group did not possess these high qualifications for admission into Great Britain, then his study was virtually unnecessary since it would have been readily conceded that no alien group possesses these qualifications.[2]

Pearson's errors of logic, his interpretations of the data, and the direction of his conclusions, all tended to support a particular attitude toward immigrant groups.

A central feature of Pearson's thinking was the notion that nature and nurture were disjunctive factors which constituted the basis of individual achievement and national progress. This is exemplified in his series of lectures on eugenics in which he dealt with social problems from the above point of view. For instance, with these lectures in mind, he wrote:

> Have not the numbers given in the past lectures taught us then a *first* fundamental principle of practical Eugenics? It is five to ten times as advantageous to improve the condition of the race through parentage as through change of environment. (193, p. 8.)

Equally central to his thinking was the notion that emphasis on either nature or nurture implied incompatible social policies.

[2] Investigations undertaken to check Pearson's results with regard to intellectual comparisons between Gentile and Jewish groups, yield contradictory results (73; 210).

Thus, in a discussion of alcohol as a "racial poison," he wrote that there were two "attitudes":

> (1) All use of alcohol will lead *pro tanto* to defective children. Its abuse is due to opportunity and to defect or moral influence.
> (2) The abuse of alcohol is one of the stigmata of degeneracy. It is not the cause of degeneracy but its product. As the production of degeneracy—whether in the form of mental defect, epilepsy or insanity—is checked, to that extent the abuse of alcohol will be checked.

He then continued:

> The acceptance of one attitude involves the demand for the cessation of all import, manufacture or sale of alcoholic drinks. The acceptance of the other demands the cessation of parentage on the part of the epileptic, the insane and the mentally defective. . . . It is for the Eugenist to consider the evidence for either policy. . . . The two policies are not in my opinion compatible. (191, p. 40.)

Pearson observed an increasing "degeneracy" in British life and attributed it to "factory legislation" which he thought detrimentally affected the racial composition of the population by introducing differential birth rates in the various strata of the population. He predicted that the current efforts of legislators and politicians would result in a further widening of the chasm in relative birth rates. According to Pearson, the most effective way of introducing desired social changes was by improving the racial stock. In his many public lectures Pearson urged legislators and politicians to favor "Nature's method" of natural selection. However, Pearson recognized that civilized conscience would not permit the unmitigated struggle for existence in the social sphere. He advocated, therefore, a system of artificial selection (eugenics) as a substitute for nature's harsh method.

Pearson's injunction that the selective birth rate should replace the selective death rate was a restatement of his preceding suggestion. Pearson's foregoing views shaped his solution to questions raised by such issues as improvement of general health, general amelioration of the conditions of the poor, elimination

of tuberculosis and alcoholism, and improvement of eyesight. In asserting that eugenics and medicine are opposed in their effects, Pearson did not explicitly argue against humanitarian practice as such. Yet his views were stated with such positive assurance and overwhelming pessimism that they would tend to discourage efforts aimed at immediate human betterment. For example, the auditors to his lecture, "National Life from the Standpoint of Science," must have felt powerless before nature's forces arrayed against human progress. This mood is exemplified in the concluding sentences of Pearson's lecture:

> Mankind as a whole, like the individual man, advances through pain and suffering only. The path of progress is strewn with the wreck of nations; traces are everywhere to be seen of the hecatombs of inferior races, and of victims who found not the narrow way to the greater perfection. Yet these dead peoples are, in very truth, the stepping-stones on which mankind has arisen to the higher intellectual and deeper emotional life of today. (187, p. 64.)

Pearson's general position with regard to social and economic measures intended to ameliorate society is set forth in his statement of 1912 that

> Selection of parentage is the sole effective process known to science by which a race can continuously progress. The rise and fall of nations are in truth summed in the maintenance of cessation of that process of selection. Where the battle is to the capable and the thrifty, where the dull and idle have no chance to propagate their kind, there the nation will progress, even if the land be sterile, the environment unfriendly, and educational facilities small. Give educational facilities to all, limit the hours of labour to eight-a-day—providing leisure to watch two football matches a week—give a minimum wage with free medical advice, and yet you will find that the unemployables, the degenerates and the physical and mental weaklings increase rather than decrease. (188, p. 20.)

In this discussion of Pearson's social views reference to his earlier socialistic position was omitted. At the age of twenty-four, Pearson lectured to revolutionary clubs and working-class groups on various socialistic issues. His pamphlet, *Socialism in Theory and Practice*, appeared in 1884. Here he expresses con-

ventional socialist views resembling those of the Fabians. He begins this pamphlet with the statement, "During the past year there was a great deal of discussion in the newspapers—and out of them—concerning the dwellings of the so-called poor." He raises the question as to why their condition is not alleviated. His answer is implied in his remark that "the labour which should be devoted to improving them [the poor] is consumed in supplying luxuries to the rich." With regard to the laboring classes he writes, "It is the fault of our present social system, and not a law of history, that the toilers should be condemned to extreme misery and poverty." As a solution to the social problem he advocates, rather than a "revolution," the education of the "capitalist" to a "higher morality." (182.) During the same period he translated a series of fiery "Songs of Socialists," songs which appealed to the "proletariat" to realize its power and to unite. With reference to his later views on the inequality of man, it is interesting to note a few lines of one of these social-democratic songs:

> And as all alike we are equal born
> Equal for all be toil and right. (181, p. 53.)

In 1894, in a review of Benjamin Kidd's book, *Social Evolution*, Pearson dissented from the idea that socialism was inconsistent with evolutionary doctrine.

> If we accept the standpoint of the socialist, that the evolution of civilised man depends on other factors of natural selection than intra-group struggle for existence, Mr. Kidd's theory of social evolution falls to the ground like a pack of cards; it finds no bottom on great "biological truths," and the supposed incompatibility of socialism with the laws of natural selection is only a bogie set up by individualist thinkers to scare the socialist, and if possible to check social changes for which they personally have no liking. (184, pp. 131 f.)

A few pages later he added, "The pious wish of Darwin that the superior and not the inferior members of the group should be the parents of the future, is far more likely to be realized

in a socialistic than in an individualistic state." (184, p. 138.)

That the content of Pearson's socialism during this period was about the same as that expressed ten years previously is evident in another review in which he dissented from the theses that "the present relations of capital and labour arise from a 'law of nature,' and that a 'law of nature' cannot change." Furthermore, in the review of another book, Pearson inclined to the acceptance of "the general desirability of our factory legislation." (183.)

From these citations it is apparent that Pearson's early attitudes included: (*a*) a general environmentalistic position, (*b*) the view that eugenic notions had a better chance of success in a socialistic state, and (*c*) the view that the stratification of society was not the result of biological factors. Beginning with his 1900 lecture, "National Life from the Standpoint of Science," Pearson definitely contradicted, through his all-inclusive use of the notion of natural selection, his earlier views.[3] From 1900 onwards Pearson interpreted natural selection as the chief source of social progress. To Pearson natural selection implied that heredity is more important than environment, that the individual makes his environment, that social stratification is the result of biological factors, that "racial progress" along eugenic lines should precede any attempts at social reconstruction, and that "factory legislation" is "cacogenic" in its effects.

It is true that after 1900 Pearson still termed himself a "socialist." Thus in a 1912 lecture, in alluding to an "anti-socialism campaign" in the academic field, he described himself as a political socialist. In defending himself against Dean Inge's statement that "the consistent Socialist hates eugenics as much as he hates Christianity, because that science maintains that nature is more important than nurture," Pearson replied, "Well, as a consistent Socialist I mean in and out of season to preach to the inconsistent Socialist that nature is more important than nur-

[3] The change in Pearson's general orientation has been noted by his son Egon S. Pearson in a biography of his father (180).

ture, and that no social changes can be stable which neglect this great truth." (192, pp. 3 ff.) That the content of his socialism had changed, however, is readily seen in comparing his social views of 1884 with those of 1900 or 1912. For instance, in 1912 he wrote:

> If we have grasped the very essence of Darwinian theory, if we have followed the recent evidence provided for the relative parts played by nature and nurture in the case of man, we can hardly accept the position that our tradition and our environment will achieve much. (192, p. 9.)

This quotation should be compared with Pearson's pamphlet on socialism or his review of Kidd's volume.

In summary, Pearson can be classified as both hereditarian and conservative in outlook, with considerable interaction between both attitudes. In his early years, Pearson was a socialist and an environmentalist in so far as the rejection of the application of the principle of natural selection to human affairs was concerned. In his early works, Pearson made no reference to the nature-nurture controversy although he was familiar with the writings of Galton and Darwin. After 1900, when the nature-nurture controversy became more definitely structured, Pearson assumed the hereditarian position, and the political concomitants were conservative. However, no implication of causation is intended concerning Pearson's changed orientation or the interrelationship of his scientific and political attitudes.

WILLIAM BATESON *1861–1926*

WILLIAM BATESON, a leading figure in the development of modern genetics, did much to advance the study of heredity through his early and vigorous espousal of Mendelism. Of him R. C. Punnett wrote (1926):

> It was well said of Darwin that his chief title to fame was that he first taught men to believe in Evolution. It is likely that future generations will single out Bateson's name as of him who first taught men to believe in Heredity. (208, p. 80.)

With regard to the applications of heredity, of Mendelism in particular, to man, Bateson's presidential address before the British Association for the Advancement of Science (1914) was significant. In his Herbert Spencer lecture, "Biological Fact and the Structure of Society," delivered at Oxford in 1912, a lecture which Bateson considered as "one of his best," the applications of biology to social and political questions were the outstanding features.

In stating his views on heredity Bateson assumed the hereditarian point of view. In his 1914 address, in demonstrating the application of Mendelian analysis to man, Bateson said:

> I admit that an assumption of some magnitude is involved when we extend the application of the same system to human characteristics in general, yet the assumption is one which I believe we are fully justified in making. With little hesitation we can now declare that the potentialities and aptitudes, physical as well as mental, sex, colours, powers of work or invention, liability to diseases, possible duration of life, and the other features by which the members of a mixed population differ from each other, are determined from the moment of fertilisation; and by all that we know of heredity in the forms of life with which we can experiment we are compelled to

believe that these qualities are in the main distributed on a factorial system. By changes in the outward conditions of life the expression of some of these powers and features may be excited or restrained. For the development of some an external opportunity is needed, and if that be withheld the character is never seen, any more than if the body be starved can the full height be attained; but such influences are superficial and do not alter the genetic constitution. (8, p. 298.)

To Bateson, the differentiation of individuals according to occupations was an aspect of biological differentiation (8, p. 310). He traced the decline of early Greek civilization to racial mongrelization (8, p. 311). The new knowledge of heredity, he thought, implied "reform of medical ethics" since "medical students are taught that it is their duty to prolong life at whatever cost in suffering." (8, p. 307.) Considering this as a kind of "occult view," Bateson thought that it would be "more humane" if doctors did not interfere to preserve "an infant so gravely diseased" that it could never be happy (8, p. 307). Interesting from the modern point of view is his statement in the same address that

> The long-standing controversy as to the relative importance of nature and nurture, to use Galton's "convenient jingle of words," is drawing to an end, and of the overwhelmingly greater significance of nature there is no longer any possibility of doubt. (8, p. 313.)

While accepting eugenic ideas, Bateson did not participate actively in the eugenics movement for he thought that biological evidence was insufficient to justify such a movement (8, pp. 371 f.). Of his few lectures on eugenics, he wrote, "Three times I have come out as an Eugenist, yielding to a cheap temptation." (8, p. 398.)

In line with his attitude that "genetic science must profoundly influence the course of human thought and ultimately the conduct of society" Bateson demonstrated the possible relevance of biology to society in several papers. He discussed democracy, socialism, property rights, education, and extension of political power in terms of biological doctrines. In these discussions, Bateson accepted a conservative frame of reference.

In his Herbert Spencer lecture, Bateson raised certain questions:

> And now regarding the central problem of social structure, the conditions of stability in the relations of the human classes to each other and to the State, has biological science any counsel of value to give? Is there any observation that naturalists have made, knowledge acquired, or principles perceived in their study of the manifold forms of life, which in this period of grave anxiety they dare to offer as a contribution to political philosophy? (8, p. 348.)

In the light of these questions, Bateson examined the validity of the claims of the "political reformer" who attempts "to raise the standard of a population" by ameliorating the conditions of life. Though these claims might lead to admirable results, Bateson thought them unsatisfactory because they could not lead to permanent racial improvement. Thus, using the analogy of a gardener who is able to increase the size of his plants through proper cultivation, Bateson wrote, "So with the crowded masses of humanity. They may, so to speak, be 'potted on.' Given hygienic conditions and better opportunities, they may develop into decent specimens but they will not turn into better kinds." (8, p. 352.) This method will not lead to progress, since "It is upon mutational novelties, definite favourable variations, that all progress in civilisation and in the control of natural forces must depend." (8, p. 352.)

In discussing democracy, he wrote:

> The essential difference between the ideals of democracy and those which biological observation teaches us to be sound, is this: democracy regards class distinction as evil; we perceive it to be essential. It is the heterogeneity of modern man which has given him his control of the forces in nature. The maintenance of that heterogeneity, that differentiation of members, is a condition of progress. The aim of social reform must be not to abolish class, but to provide that each individual shall so far as possible get into the right class and stay there, and usually his children after him. (8, p. 353.)

In 1919, in his presidential address before a local scientific association, Bateson again turned to the question of democracy.

Democracy, the system which confers equal political power on individuals, in defiance of genetic inequality, may, by foregoing that material progress which we know as civilisation, produce a case of spurious equilibrium, the equilibrium of chaos and disruption, but the natural instability caused by the fact of physiological inequality is not unlikely to produce, as heretofore, its recurrent effects. (8, p. 360.)

To Bateson, democracy was the "combination of the mediocre and inferior to restrain the more able." (8, p. 360.) On economic matters Bateson likewise maintained a conservative view. In 1914, after observing that "the rewards of commerce are grossly out of proportion to those attainable by intellect or industry," he wrote:

Nevertheless, capital, distinguished as a provision for offspring, is an eugenic institution; and unless human instinct undergoes some profound and improbable variation, abolition of capital means the abolition of effort; but as in the body the power of independent growth of the parts is limited and subordinated to the whole, similarly in the community we may limit the powers of capital, preserving so much inequality of privilege as corresponds with physiological fact. (8, p. 315.)

Bateson's views were colored by his acceptance of Malthusian doctrine which induced an unusual degree of pessimism in his discussions of human affairs. He thought that British economy was inextricably dependent upon its available coal supply. Foreseeing a decreasing coal productivity in a relatively short period of time, he thought that there should be a corresponding decrease in the size of the population if living standards were to be maintained (8, pp. 346 f.).

Although the concept of mutations usually underlay Bateson's scientific thinking in relation to human affairs this was not always the case. Influenced by the applications of Darwinism to man, he expressed the following views in a letter which was written in 1887 while he was on a scientific expedition in Siberia:

When I had seen even less of the world than now, I got somehow the idea that all men were equal and had equal rights. Hence it seemed to be clear that no one could be justified in appropriating

his neighbour's goods or in controlling his neighbour's actions. A very slight experience suffices to shew the preposterous fallacy of this view. All men are no more equal than all animals and plants are equal. A Russian is no more the equal of an Englishman, and a negro is no more the equal of a white man than a Kirghiz pony is the equal of an English racer, or the phylloxera the equal of the vine. If you think these things life stops short for you. Life without killing and without a struggle cannot go on. It is possible probably to increase or diminish the intensity of the struggle, but that is another thing. (8, p. 14.)

In summary, Bateson can be classified as having both a hereditarian and a conservative position.

WILLIAM McDOUGALL *1871–1939*

THIS EMINENT English-born psychologist came to America in 1920 to assume chairmanship of the department of psychology at Harvard University. McDougall was a pioneer in the development of modern psychology, and his name is chiefly identified with the doctrine of instincts, a doctrine which exerted a wide influence in psychology and the social sciences. His writings cover the major aspects of learning—psychology, sociology, biology, philosophy and history. Of himself he wrote, in 1930, "There is perhaps no man living who has had a more intensive and varied training in the natural sciences." (145, p. 207.) In addition to his scientific writings, McDougall has written extensively on political and social questions, chiefly after the first World War. The better known of these books are *Is America Safe for Democracy?* (1921) and *Ethics and Some Modern World Problems* (1924). Practically all of McDougall's books dealing with political and social questions, and his scientific writings as well, involve extended discussion of nature-nurture questions and their various social implications.

Perhaps the most outstanding feature of McDougall's thinking is its pragmatic orientation. With regard to psychology he wrote, "The aim of psychology is to render our knowledge of human nature more exact and more systematic, in order that we may control ourselves more wisely and influence our fellow men more effectively." (150, p. 1.)

In describing his life aims in 1930, he wrote, "I still hold, as I held in my youth that it [psychology] is the science of most urgent importance in the present age, when, for lack of sufficient knowledge of human nature, our civilization threatens to fall into chaos and decay." (156, p. 221.)

The relationship of human nature to the surrounding world was a favorite theme with McDougall; he thought, for example, that if psychology had been given more emphasis in Great Britain the difficulties in dealing with India and China might have been avoided (155). The implication that psychology should be a stabilizing influence in society was made explicit in a discussion of the social effects of "Freudianism." He declared:

> The relations between the generations are already endangered by the many violent changes of the social order which we owe to physical science. It is for psychology to prevent, to provide against and to rectify the disastrous consequences of these too violent and disruptive changes. But instead, the Freudian psychology has worked as an additional disruptive force, especially among the strata of our communities which more than any other have the power and function of moulding social tradition and practice. (160, p. 196.)

McDougall's attitude toward the interrelationships between psychology and society will be considered in the section dealing with his social and political views.

In his *Introduction to Social Psychology* (1908), a text which has gone through more editions than any other text in psychology, McDougall developed his doctrine of instincts into a comprehensive theory of individual and collective behavior. According to this doctrine,

> The human mind has certain innate or inherited tendencies which are the essential springs or motive powers of all thought and action, whether individual or collective, and are the bases from which the character and will of individuals and of nations are gradually developed under the guidance of the intellectual faculties. These primary innate tendencies have different relative strengths in the native constitutions of the individuals of different races, and they are favoured or checked in very different degrees by the very different social circumstances of men in different states of culture; but they are probably common to the men of every race and of every age. If this view, that human nature has everywhere and at all times this common native foundation, can be established, it will afford a much-needed basis for speculation on the history of the development of human societies and human institutions. (145, p. 19.)

In examining the whole range of individual and collective behavior, McDougall, in practically all cases, utilized either a single instinct or a combination of instincts as the fundamental explanatory principle. McDougall's exclusive emphasis on innate patterns was not a necessary outcome of the doctrine of instincts. According to his own definition and usage of the notion of instinct, the stimuli adapted to the instincts are necessary conditions for the appearance of instinctive modes of action (146, p. 29). Therefore, logically speaking, neither innate patterns nor their appropriate stimuli enjoy a distinctive primacy. McDougall, however, proscribed the causal role of environmental factors in his explanations; this represents a judgment of choice on his part. Assuming the validity of the doctrine, not only McDougall's emphasis upon the innate aspects of behavior, but also his use of particular instincts in the interpretation of various behavior patterns, represent a choice. McDougall himself recognized the arbitrary nature of his interpretations when he wrote, in discussing the applications of "primary tendencies to society":

> The processes to be dealt with are so complex, the operations of the different factors are so intricately combined, their effects are so variously interwoven and fused in the forms of social organizations and institutions, that it would be presumptuous to attempt to prove the truth of most of the views advanced. . . . In spite of the dogmatic form adopted for the sake of brevity and clearness of exposition, my aim is to be suggestive rather than dogmatic, to stimulate and promote discussion rather than to lay down conclusions for the acceptance of the reader. (146, pp. 265 f.)

McDougall's exposition of the doctrine of instincts, the enthusiasm for which "spread like wildfire" (168, p. 295) when it was first published, was no longer regarded as acceptable fifteen years later in either psychology or social science. The change in the scientific acceptance of this doctrine is largely the result of the vigorous growth of the "anti-instinct" movement which began in 1919 with the critique by Knight Dunlap and ended, in a

formal sense, with Kuo's complete rejection of the notions of instinct and heredity (141). John Dewey's acceptance of the doctrine in 1917 and rejection of it in 1922 indicates the reversal in attitude that took place (75; 76).

A question can be appropriately raised concerning the factors involved in the acceptance of the doctrine by McDougall and by others. Although, in a strict sense, the answer to this question is not relevant here, nevertheless it touches upon the nature-nurture controversy. Psychologists found the doctrine useful because it systematized certain aspects of their field (116). Sociologists and social psychologists accepted the doctrine because, expressed in a biological vocabulary, it represented a trend away from the prevailing "imitation and suggestibility" and "intellectualistic" schools which were thought to be sterile (84). Yet another factor lies in the field of English history. The eugenist movement, which had crystallized as a distinct movement several years before McDougall's publication of his *Social Psychology*, placed emphasis upon the view that intellectual ability was inherited and not easily modifiable. The next logical step would be to bring impulses, or urges to action, within the same framework. Now the writing of the *Social Psychology* was suggested to McDougall by one of England's leading eugenists of the period, C. W. Saleeby (211, p. 134). It is a plausible interpretation that McDougall, himself a zealous eugenist, undertook the task for the purpose of strengthening eugenic doctrine. McDougall's emphasis on heredity in his exposition of the instinct doctrine is thus consistent with the eugenist's emphasis on the innate aspects of intellect.

McDougall's emphasis on heredity also extended, as is to be expected, to the question of the origin of individual differences in intelligence. He wrote that "innate capacity for intellectual growth is the predominant factor in determining the distribution of intelligence in adults, and that the amount and kind of education is a factor of subordinate importance." (148, p. 47.) Consistent with this view is his assertion that the "re-

sults of army tests indicate that about 75 per cent of the population has not sufficient innate capacity for intellectual development to enable it to complete the usual high-school course." (148, p. 162.)

McDougall's emphasis on heredity was conjoined to his attitude that the innate was unmodifiable. In 1934 he wrote, "Innate constitution can be only superficially modified by environmental influences, whether in physique, in temperament, in disposition, in temper or in intellectual capacities." (159, p. 185.) Or, as he more tersely put it in the same year, "Neither teaching nor preaching, nor both together, can do much to modify the actions, the feelings, and the emotions of men." (159, p. 205.)

McDougall's espousal of the doctrine of racism is still another example of his emphasis on heredity, but this time on racial heredity.[1] The characteristic features of French and English institutions and traditions, for example, are explained in terms of the larger amount of "Nordic blood" possessed by the English (148, pp. 72 f.). The evidence McDougall adduces to support his views is quite weak. Typical of his logic,[2] in this respect, is the statement that

> the colored men of the Northern States showed distinct superiority to those of the South, in respect of their performance in the army intelligence-tests. Have they not a larger proportion of white blood? *I do not know, but I suspect it.* (148, p. 54.)[3]

Of interest to psychologists is McDougall's rejection of psychoanalysis as a generally valid doctrine, a rejection which involves racist views.

McDougall had submitted himself to Jung for analysis in order to determine whether there was any truth to Jung's claim that he could discover the racial affiliation of an individual through the analysis of dreams. To McDougall this claim was

[1] His book, *Is America Safe for Democracy?*, is written from the racist point of view.

[2] This example is cited because it presents another interpretation of the superiority of the northern Negro on the army tests.

[3] Italics mine.

of "first importance," for it "would carry the doctrine of racial peculiarities of mental constitution much further than I have done so far." (148, p. 126.) McDougall was not satisfied with Jung's analysis because only "faint and doubtful traces" of his "archetypes" were uncovered. However, he continued:

> One of Jung's arguments weighs with me a good deal in favor of his view. He points out that the famous theory of Freud, which he himself at one time accepted, is a theory of the development and working of the mind which was evolved by a Jew who has studied chiefly Jewish patients; and it seems to appeal very strongly to Jews; many, perhaps the majority, of those physicians who accept it as a new gospel, a new revelation, are Jews. It looks as though this theory, which to me and to most men of my sort seems so strange, bizarre, and fantastic, may be approximately true of the Jewish race. (148, p. 127.)

McDougall, in *Is America Safe for Democracy?*, indicates the historical basis for some of his own psychological investigations as well as those of his students. In an earlier phase of his thinking, about 1908, he was concerned with the truth of the proposition that the "upper social strata, as compared with the lower, contain a larger proportion of persons of superior mental endowments." He continued:

> But it has been the greatest weakness of the eugenic propaganda that it is so largely founded upon and assumes the truth of this proposition. For the critics and scorners of eugenics have vehemently denied it, or poured ridicule upon it; and no proof of it was available for their refutation. (148, Preface.)

In order to fill "this great gap in the eugenist argument," he guided two of his students, Cyril Burt and Horace B. English, in the appropriate investigations which led to the findings of marked class differences in intelligence—findings which were interpreted as indicative of innate class differences (33; 85).

McDougall's emphasis on heredity is also manifest in his applications of psychology and biology to the "great problems of national welfare and national decay." Some of these problems, which exhibit a wide range, are: rise and fall of nations, rise of democracy, social legislation, Christian ethics,

"Indian Mutiny" of 1857, "acquisitive societies," and so on (148; 153). His interpretations are such as to indicate opposition to democracy, social legislation, and so on. Before proceeding to the discussion of his views, it is well to keep in mind McDougall's own evaluation of his political outlook. In presenting the theme of *Indestructible Union: Rudiments of Political Science for the American Citizen* (1925), he wrote:

> I cannot hope to have succeeded in writing with strict impartiality on all the many questions I have touched. I must confess to a conservative bias. . . . This prejudice which I thus frankly avow, is perhaps constitutional with me. (153, p. ix.)

A recurring notion of McDougall is that the operation of democratic forces would lead inevitably to a breakdown of civilization. In 1921 he wrote that Great Britain would decline as a civilization chiefly because of the successful development of its democratic institutions (148, p. 157). Several years later he wrote, with reference to the functioning of American institutions, "a nation which allows itself to drift into an ultra-democracy does a grave injury to civilization, to all the higher interests of mankind." (152, p. 192.) [4]

A critical obstacle to the development of a workable democracy, he thought, was the differential birth rate. Many of the ills of civilization were attributed by him to the differential birth rate, and a chief effect of democracy would be to sharpen this differential (152, Chap. 8). McDougall was so pessimistic over the possibilities of democracy in 1932 that he wrote:

> The decay of democratic institutions and the passing of freedom are the natural correlatives of the general decline of respect for law and the immense development of crime and corruption. They have already gone so far that it may well be questioned whether there is any hope of the survival of democratic institutions in America; whether some form of Fascism or oligarchy does not offer the only hope of order and of the modest degree which is compatible with such a system. (157, p. 43.)

[4] By "ultra-democracy" McDougall had in mind the idea of complete social and political equality (152, Chap. 4).

The nature of the interrelationships between his psychological views and his social outlook suggests that McDougall conceived of social action as the testing ground for the validity of psychological doctrine. This conception was implied in his view, already cited in discussing the social effects of "Freudianism," that psychology should not be "socially disruptive." (160, p. 196.) The consideration of psychology in relation to social and political factors was dominant with McDougall. In this vein he criticized Locke's environmentalistic doctrine of *tabula rasa* because it "played a great part in determining British policy in its relations with British dependencies and their populations, notably India." (147, pp. 152 f.) He pointed out, in a justification of the strengthening of British rule in India, that British power there was "tottering." (155, p. 136.) Evidently, to McDougall, Locke's psychology must have been a disruptive influence in empire relations. McDougall associated the *tabula rasa* doctrine with the democratic tendencies of society (158, p. 82). Further, he explained, on a sociological basis, the development of Locke's political principles as the result of Locke's attempt to justify the revolution of 1688 (147, p. 4).[5] Its widespread influence in American thinking was a tendency that had to be controlled (149). In discussing the merits of Watsonian behaviorism, which to McDougall represented a reinstatement of the *tabula rasa* doctrine, he wrote, "Dr. Watson's views are attractive to those who are born tired, no less than to those who are born Bolshevists." (154, p. 42.) [6]

Just as McDougall held that environmentalism was socially disruptive, he likewise maintained that emphasis on heredity

[5] Parenthetically, there is some truth to McDougall's view that *tabula rasa* "consorted well with liberalism." Thus, Locke, an outstanding progressive of his time, formulated a doctrine which would further progressive aims. On the basis of *tabula rasa,* reforms are rendered theoretically possible, since from that view social arrangements and evils are not ingrained in the innate equipment of man.

[6] It is not to be understood here that McDougall rejected behaviorism for this reason; we are simply considering its social effects, as conceived by McDougall.

was "socially stabilizing." This point was brought out in his reply to his critics during the "anti-instinct" movement. In his reply he maintained that "of all hypotheses that have been tried, that of human instincts remains, in spite of much loose use of it, the most fruitful and the one which we can least afford to reject." (149, p. 331.) In clarifying this remark, a few pages later, he wrote:

> In conclusion, I would insist that those who deny instincts to the human species are not, as some of the younger of them seem to imagine, boldly striking out a new line. They are true reactionaries.
>
> Lastly, I would insist that the issue of this controversy is a matter of the largest practical importance. If the deniers of instincts should gain the day, that would mean a return to the social philosophy of the mid-nineteenth century, hedonistic utilitarianism, with its belief in the absence of all significant differences between individuals and between the races of mankind, and the belief in the limitless perfectibility of all mankind by the processes of education alone. To some of us it seems that much harm has been wrought by these dogmas, and that the Western world is just now beginning to find a better way than that which has led to the brink of irretrievable disaster. I, for one, am convinced that social health and national prosperity and stability require that we shall fully recognize the complexities of human nature and the large differences of innate constitution between one man and another. (149, p. 333.)

This attitude is reflected in his books on political and social science, which were written in the same period. The common element in these books is the emphasis on the importance of innate qualities in human affairs.

In brief, McDougall may be classified as a hereditarian and as a conservative. In terms of his own statements, there is evidence to indicate that his social views were instrumental in molding his psychological theories. However, it is quite unknown whether his own statement of the origin of his ideas is correct in terms of underlying motivational patterns. Even if it is correct in relation to McDougall, it does not necessarily indicate a generally valid causal relationship, either with regard to his total thinking or with regard to the thinking of other individuals.

CHARLES B. DAVENPORT *1866–1939*

LIKE MANY of his contemporaries, who have been considered in this study, Davenport had both a scientific and a popular side. In science he was a biologist, and on the popular side he was the outstanding exponent of eugenics in America. His two books on eugenics (1910, 1911) were among the first to be published on the subject. He was president of the American Genetics Association, an editor of *Biometrika,* and director of the Experimental Station at Cold Spring Harbor for more than twenty-five years. In his studies of heredity he was well known for his adherence to Mendelian explanations rather than to the biometric school of Pearson. Davenport and his followers published many monographs which exhibited the influence of heredity in various phases of genetics, eugenics, psychology, and medicine.

With regard to the nature-nurture controversy Davenport consistently emphasized heredity. His very search for Mendelian ratios in family lines with reference to all qualities—intellectual, characterological, emotional, mental and physical disease—denies the possibility of any influence of the usual environment. It was a common attitude that if a quality "mendelised" then "hereditary transmission" was effectively demonstrated with the implication that environment was of no effect. Davenport's emphasis on heredity can be understood in this light. Illustrative of his attitude is his remark that "sincerity or insincerity, generosity or stinginess, gregariousness or seclusiveness, truthfulness or untruthfulness, are all qualities whose presence or absence is determined largely by the factor of heredity." (70, p. 36.) This Mendelian type of thinking was severely criti-

cized by Pearson and his colleagues. They criticized the ill-defined nature of Davenport's terms and pointed out that considering feeble-mindedness as a simple Mendelian recessive was inconsistent with the known facts (118). Davenport vigorously contested these criticisms (71). However, the modern emphasis justifies Pearson's criticisms.

Nowadays it is definitely known that pellagra is the result of dietary insufficiency, even though there may be a genetic component in determining susceptibility. In 1916 the specific dietary factor involved was unknown; but prevailing opinion, nevertheless, assumed that pellagra was the result of some agency of the environment, such as a germ, inadequate diet, or poor sanitary conditions. In studying this problem, Davenport accepted the view that pellagra is "in all probability a specific infectious disease communicable from person to person." (72, p. 2.) However, he attempted to bring out the hereditary factor by demonstrating constitutional susceptibility to the disease. To strengthen the hereditarian view of the disease, he observed, correctly, that there is a definite mental component associated with the physical symptoms of the disease. With this relationship in mind he wrote:

> The mentally insufficient are, on the whole, less likely to appreciate the importance of sanitary surroundings and less able to avail themselves of them, and the reports of the pellagra commission prove a close relation of pellagra to poor sanitation. (72, p. 2.)

In other words, pellagra is fundamentally the outcome of an innate individual defect. Here, however, Davenport is really concerned with locating responsibility for the disease rather than determining its cause, for he tacitly accepts the then common view of its causation but minimizes its relevance by introducing the notion of responsibility.

Davenport's bias is also illustrated by his view that diabetes, epilepsy, feeble-mindedness, dementia praecox, and other characteristics, are Mendelian factors (66, Chap. 8). To his way of thinking, the importance of heredity implied that the existing

environment was of no influence, and that heredity could not be overcome by an altered environment. This view, as stated before, was implicit in his search for Mendelian ratios. He gave an explicit statement of it in an address to the International Congress on Hygiene and Demography in 1913:

> Society is trying to deceive itself into a belief that improved nurture can take the place of deficiencies in breeding. And so this congress meets this week, largely inspired by this hope. Vain hope! You may paint out the leopard's spots, but her cubs will have them just the same. And, while you are reducing the death rate from tuberculosis in this generation, you are spoiling nature's beneficent work of the past, so that, after man has finished with his meddlesome interference, she will have to do it all over again. For the high death rate from tuberculosis in the early years of New England had left the old stock a highly resistant race. But now we are saving those with the consumptive diathesis to use as breeders of the next generation. You may listen to the student of heredity or not; but he tells you, without a shade of hesitation, that permanent social improvement is got only by better breeding. (69, pp. 659 f.)

He concluded his talk by referring to the "present menace that hygiene offers to the race." (69, p. 659.) Not only does Davenport present the existing environment as a *fait accompli*, but he also expresses a definite attitude toward "social improvement," an attitude unfavorable to plans for "social reformism."

To Davenport, the facts of biology and social trends suggested the idea that heredity and social reform were opposed in their actions. In an article entitled "Euthenics and Eugenics" (1911), such an antithesis is discussed. He opened this article by discussing various social evils like pauperism, crime, feeblemindedness, and so on. He then posed the question, "What is the cause and what the remedy of this state of things?" He suggested two answers:

> The answers to this inquiry take two general trends. One set of reformers urges that the socially unfit are the product of bad conditions and that they will disappear with the establishment of some modern Utopia. The other set of reformers urges that the trouble lies deeper—in the blood—and is the outcome of bad breeding; the

trouble will disappear if marriage matings are made wisely. (65, p. 16.)

Henry George and other reformers were quoted in order to clarify the first answer. Contrasted to the answer of the reformers is the one of "Eugenics." In this latter answer Davenport discussed the usual facts of inheritance. In conclusion, he wrote that "improvement of conditions is only palliative. Our only hope, indeed, for the real betterment of the human race is in better matings." He continued, heredity, to the eugenist, is the "great hope of the human race" and "its savior from imbecility, poverty, disease, immorality." (65, pp. 19 f.)

In the same period, the conservative nature of his position is further made evident in his application of the principle of natural selection to some of the economic questions that were then being raised. Thus he wrote that "wages, salaries, profits, honors are rewards that society gives to those who are its effective and good members." (70, p. 37.) Further, he observed that, " 'big business' has come to constitute the governing class" in America by the fact that the "strongest men" are "lured" into it (67). These views of Davenport are applications of the principle that an individual's worth, as measured by various concrete achievements, is a fair test of his genetic status. The conservatism of his position is indicated by the fact that there was an insufficiency of evidence for the view that "big business" attracted the best and most capable individuals.

In brief, Davenport can be classified as a hereditarian on nature-nurture issues and as a conservative in his socioeconomic views.

FREDERICK A. WOODS *1873–1939*

Woods, who has been described as the "American Galton," earned his scientific reputation through the extension of biological principles to social science. He was a lecturer in genetics at the Massachusetts Institute of Technology from 1903–23, editor of *Journal of Heredity*, and a vice-president of the International Congress for Studies on Population Problems (Rome, Italy, 1931). Born in America, he resided there until 1928 when he left to take up permanent residence in Rome. His fundamental contribution to the nature-nurture controversy was his book, *Mental and Moral Heredity in Royalty* (1906), which exerted wide influence in psychology and eugenics by its demonstration of a quantitative relationship between intelligence and morality.

Woods was concerned, in most of his scientific writings, with determining the relative significance of heredity and environment. His emphasis was consistently on the predominant importance of heredity. His scientific goals with regard to the question were set forth in a paper to the First International Eugenics Congress (1912).

> The eugenics movement, in order to justify itself in the eyes of the body politic, must first of all emphasize heredity; but it must do more than that. It is incumbent on the advocates of eugenics to prove that the desired betterments in the social organism cannot be looked for as a consequence of environment; for, if they can, then why take up a new remedy? Every research in anthropology and history, which shows that nature is stronger than nurture, adds that much to the eugenist's capital. (283, p. 246.)

Woods then proceeded to discuss one of his researches which

tended to "strengthen our belief in the importance of inborn qualities." (283, p. 246.)

His point of view on nature-nurture questions is well represented in his statement (1925) that

> Human beings are what they are, very largely, if not almost entirely, by reason of their inborn qualities depending on their differences already contained in the "chromosomes" of the germ cells from which they are developed and born. This statement rests on the results of research work done within the last twenty-five years. (286, p. 533.)

Woods was much interested in developing a science of history for which he coined the word "historiometry." To him biology was the "master-key of history" (284, p. viii). By this he meant that the basic causes of historical change were inherent in the "germ-cells" and in the principle of natural selection (284, p. 273). Thus, he attributed wars to the innate qualities of man, and consequently, he thought that wars could be eradicated only by natural selection (286). Social progress and retrogress were explained in terms of the activities of exceptional ruling monarchs (284).

Woods' hereditarian bias is clear in his interpretation of his results pertaining to the correlation of intelligence and morality in royalty. Using the "adjectives" of historians, Woods rated European monarchs, those who lived from the tenth through the nineteenth centuries, for intelligence and morality on two separate scales of ten steps each. He calculated a correlation coefficient which turned out to be 0.34. In order to determine whether this correlation was the result of genetic factors he correlated parents' ratings with those of their offspring, following Pearson's methods, and obtained a value of 0.3007. This result was a decisive reason "for the belief that heredity is almost the entire cause for the mental achievements of these men and women." However, the average coefficient obtained by Pearson on parent-offspring correlations was 0.50. Woods' result, then, is significantly different from that of Pearson's, whose

value was the generally accepted one. Noting this discrepancy, Woods ventured an explanation which, however, was inconclusive. He added that "my own figures must stand for what they are worth." (280, pp. 272 f.)

His emphasis upon heredity and his denial of the potency of the environment led Woods to postulate a biological law to account for the ineffectuality of the environment. He postulated an inverse relationship between the influence of environment and the degree of evolutionary complexity. The higher up one goes on the evolution scale, the less the influence of environment. In lower animals and plants environment is important, but with respect to the highest of the evolutionary characteristics, mental and moral, "we can expect the least results from outward forces." (282.)

Woods has been explicit in the statement of the social implications which he thought followed from his work. Furthermore, there is evidence that Woods' choice of problems for investigations was influenced by current social issues. For instance, in his basic work on intelligence and morality, he wrote:

> The primary object of the research, the results which lie within these pages, is to determine the proportionate share taken by heredity in the formation of mental and moral life.
>
> A score of problems, like the negro question, self-government for the Filipinos and practical philanthropy, await the guiding finger of science on the very cardinal point. Are our natures predetermined; or will fine and fit surroundings, just laws, hygiene, education, or in other words, equality of opportunity, bring about the long looked for Utopia? John Brooks says, "I have rarely heard a debate between one who thought himself an individualist and one who claimed to be a socialist that did not, at bottom, turn upon the inquiry about the relative importance of man's character and that of his surroundings." (280, p. vi.)

It is evident, then, that Woods was not alone in maintaining that the success of social reformism depended upon the relative influence of heredity and environment. Woods' emphasis on heredity, therefore, should have meant to him that social reformism was not based on fact. He wrote:

All the evidence that we possess renders it highly improbable that any of the ordinary differences in human environment, such as riches and poverty, good or bad home life, have more than a very slight effect in modifying these complex and high organic functions the improvement of which is the hope of the altruist and the reformer. (282, p. 334.)

This outlook was fundamental to Woods.

In his study on intelligence and morality, Woods interpreted his results to indicate the general superiority of the "royal breed" which was ultimately derived from Nordic stock (284, p. 257). In his second book, *Influence of Monarchs* (1913), his theme was that the source of all national progress resided in the germ cells of ruling monarchs (284, pp. 265 ff.). Woods subjected this hypothesis to an extensive historical, statistical, and biological analysis and concluded that his doctrine was valid. The arbitrariness of his methods in arriving at this conclusion is brought out in his selection of criteria as to what constitutes the goodness of a nation under the rule of a monarch.

The question of political liberty and how far this is to be considered a material and how far a spiritual advantage, sometimes, though not often, enters in a way to cause perplexity. One frequently finds that under strong kings the country flourished in almost every way except that the people were oppressed. It is naturally difficult to weigh the value of political and personal liberty against prosperity in commercial, industrial, or other materialistic affairs; but the question which I am dealing with is as far as possible the economic or material side apart from the intellectual or ethical. (284, p. 10.)

In this same volume Woods contrasted the "democratic force" with the "aristocratic force." He wrote, "The democratic force is made up for the most part of impulses belonging to the *milieu*, to ideas, institutions, combinations on the part of the proletariat, revolutions, diffusion of rights of suffrage, and perhaps to the greater extension of education." (284, p. 302.) On the other hand,

The aristocratic force is made up of impulses lying in the germplasm. Its consequences have been continually coming to the fore. No matter what may be the form of government, nor how much

the laws of man give power, in theory, to the people, as long as sexual selection tends to mate like with like, just so long the laws of mental heredity will work towards the formation of governing classes inherently superior to the sons of other men. Universal suffrage and universal education, the most carefully equalized scheme of social opportunity cannot prevent this tendency of the homogeneous to pass into the heterogeneous—this splitting up of mankind into sub-varieties, castes, and breeds. It is part of the trend of organic evolution. (284, pp. 302 f.)

Woods has developed these ideas into a sociological theory called "social conification" which purports to explain the "increasing stratification of society into two classes" and the rise and fall of the "upper classes." (287.)

Woods' views on heredity and their alleged social implications were colored by his acceptance of the Nordic doctrine. To him, historical progress was largely due to the Nordic stock (285; 286). In a discussion of the "Boston Police Strike" (1921), he commented that there was a "racial element in the production of anarchy." (286, p. 539.) On the other hand, in this same situation, "the 'aristocracy' joined hands like a flash and took control for law and order. It would seem that all the Nordic peoples have an instinctive horror of anything other than well organized government." (286, p. 539.) He pointed out that the United States should not fear "an upheaval" as long as it has a "substantial percentage of Nordic stock." (286, p. 539.)

Although Woods' views on social questions are always stated in some biological context, nevertheless, he can be classified as being opposed to social reform and in favor of the *status quo*. For his views were not the necessary consequences of biological doctrine. It is interesting to note in this connection that Woods completely identified democracy with environment and aristocracy with heredity.

In brief, Woods may be classed as a hereditarian in science and as a conservative in his social and political views.

EDWARD LEE THORNDIKE *1874–*

THORNDIKE, an outstanding product of the New Psychology of the 1890's, and a student of William James, attained scientific eminence at a comparatively early age. His well-known doctoral dissertation was written at twenty-three, and at twenty-four he became professor of educational psychology in the then newly organized Teachers College, Columbia University, where he remained until his retirement in 1940. Thorndike's original experiments and vigorous exposition of psychological and educational principles have assured him a permanent position in scientific thought. His influence, however, was not confined to pure science, for his investigations were of general interest. Furthermore, Thorndike, with his pragmatic orientation, wished to see his results directly applied to society. Thus, he expressed his views in diverse ways: publication in scientific and popular journals, books, public and classroom lectures, and direction of doctoral dissertations.

Much of Thorndike's thinking in psychology deals with the nature-nurture problem and its various implications for society. Two of the three volumes of his epoch-making *Educational Psychology* (1913) are devoted to discussion of this topic. His contributions to the nature-nurture problem, which include both interpretations and experimental investigations, still form part of all adequate thinking on the subject.

The principal features and tendencies of his thinking relevant to nature-nurture issues make it possible to classify him as a hereditarian, a designation which he himself seems to accept. Typical of Thorndike's outlook is the emphasis upon quantitative measurements of individual differences in such psychologi-

cal traits as intelligence, learning, ability, and emotional behavior. In recent years, he has undertaken the novel investigation of measuring and correlating individual differences in the "goodness of life" or "welfare" of American cities.

Such demonstrations of individual differences usually carry along with them the idea that these differences are "enormous" or "wide." (245, p. 5.) Characterization of differences as "wide" implies an evaluation of the importance of the differences rather than a statement of fact, for there exists no objective frame of reference for judging the size of such differences. The evaluative nature of the concept of "width" can be judged by the type of context in which it appears. For example, in one context, Thorndike discusses the "enormous differences of original nature" which, according to his way of thinking, should serve to dampen the enthusiasm of philanthropists (257, p. 442).

In discussions pertaining to the causation of individual differences, Thorndike interpreted his own results and those of others to support the genetic interpretation. For example, in 1911 he wrote, "On the whole, intellectual and moral individuality seems to be determined to a very large extent in the germs." (245, p. 43.) To Thorndike this idea implied that the differences in achievement of individuals living in the same socioeconomic environment are also the result of innate factors, for in 1903 he wrote that "differences in achievement are largely due to differences of inborn nature." (243, p. 43.) In 1943, by which time statistical technique had advanced considerably, he gave a quantitative statement of causal relationships. In a discussion on the causation of "welfare," he wrote:

> In the case of the million or so persons coming of age this year in the United States, about three fourths of the variation in abstract intelligence is attributable to the genes they were born with. I venture the estimate that at least half of the variation in health, character and other abilities than intellect is attributable to the genes. Welfare then depends upon who is being born. (259, p. 175.)

Similarly, in a discussion of "welfare" or "goodness" of cities,

he localizes the chief causative factors in the genes (254, p. 74).

With regard to those features of behavior which deal with impulses and wants, Thorndike has consistently maintained the hereditarian view. This attitude is implied in his statement of 1913: "Every human being . . . tends by original nature to arrive at a status of mastery or submission toward every other human being, and even under the more intelligent customs of civilized life somewhat of the tendency persists in many men." (247, p. 93.) In 1912 he thought that "much of the misery of the world has been due to the misdirection of the mastering and hunting instincts." (246, p. 86.) He has expressed similar views in 1940 (259, Chap. 1). Thorndike attached special importance to his investigations dealing with the relationship of intellect with morality. He explained the obtained correlation of approximately 0.50 in terms of genetic factors (cf. 253). Thorndike has attributed "one fourth of the world's progress" to this relationship (248, p. 142).

In his early statements (1900) Thorndike placed some stress upon environment, at least in so far as it was responsible for the inculcation of moral principles. He stated, too, that environment was the "decisive factor" in causing criminal behavior (242, pp. 194 f.). However, after 1906, he emphasized the genetic causes of crime and of morality. Frederick A. Woods' study, *Mental and Moral Heredity in Royalty* (1906), which emphasized a genetic relationship between intellect and morality, may have been partly responsible for Thorndike's increased emphasis upon heredity (cf. 250). Thorndike's long-standing interest in the laws of learning may be taken as recognition of environmental effects. It should be mentioned, however, that this point was not a controversial one in nature-nurture discussions.

To many, the crux of the nature-nurture controversy was not the existence of inherited intellectual differences but rather the modifiability of such differences. On this point, Thorndike supported the view that such differences are largely unmodi-

fiable within the existing range of the social and economic environment in the United States (251, p. 235).

A distinctive conceptual tool, which Thorndike used in interpreting results of nature-nurture investigations, was the principle of environmental selectivity: genes or innate factors of man are such that, in general, they lead the individual to choose or create that environment for which he is best suited (244, pp. 122 f.). Thorndike used this principle to interpret Cattell's finding that scientific men come from cities with greater proportional frequency than from rural areas. Thorndike explained this finding by asserting the hypothesis that cities attract the brilliant, and that consequently one should expect to find brilliance in the cities (244, p. 122). It is to be realized that Cattell had interpreted his findings in terms of an environmentalistic hypothesis, cities offering greater opportunity for development.

Most of Thorndike's recent work, in which a hereditarian point of view prevails, extends correlational analysis to the sociological problem of the measurement of the "welfare" status of cities and to the determination of weights to be attached to various causative factors (254; 256; 258). In this extended investigation Thorndike studied hundreds of facts concerning a city, facts referring to the broad areas of population, education, religion, health, and so on. He defined, quantitatively, three major characteristics of a city—its "G" score, its "I" score and its "P" score. The "G" score of a city is a measure of its welfare status; the "I" score refers to the income of the city and is a rough measure of environment; the "P" score refers to the personal qualities of the inhabitants of the city and is a rough measure of heredity. The first objective in this investigation was to display the wide variation among American cities in their "G," "I," and "P" scores. The second objective was to obtain some numerical estimate of the relative importance of the "I" and "P" factors in determining the variability in the "G" factor. Utilizing the techniques of multiple and partial correlations and path coefficients, with the "G" factor as the independent varia-

ble, Thorndike calculated the percentage of variation in "G" attributable to each of the "I" and "P" factors. In his study of 144 smaller cities Thorndike concluded that the "P" factor was responsible for most of the variation in the "G" factor. With this fact in mind Thorndike wrote:

> The main cause of a good community life is . . . the intelligence and morality of its residents, or whatever the personal qualities are which make them literate, free from syphilis, averse to homicides, given to owning their homes and having telephones rather than to expenditures for excitement and vice. (258, p. 73.)

The limitation on causal relations, implicit in this last quotation, was removed when he wrote that "everywhere we look, we find the personal qualities of the population the most important cause of a community's welfare" (258, p. 73). Thorndike's causational analysis implies a method of reforming a community. He wrote, "Cities are made better than others in this country primarily and chiefly by getting able and good people as residents . . . the second important cause . . . is income." (254, p. 67.) Thus it is that Thorndike is led to advocate the eugenic program as the proper way of inducing desirable community changes (254, p. 67).

Thorndike has used the correlational technique to determine the effectiveness of educational efforts in producing changes in welfare. This phase of the study, which was an aspect of his investigation on the welfare of cities, was stimulated by Bagley's *Educational Determinism* (1925). After the first World War the results of testing soldiers with the army intelligence tests received considerable attention. There was much variation between the states on these tests. H. B. Alexander, followed by Bagley, calculated correlations between educational status of states and average test scores achieved by their soldiers; "high" correlations were obtained. Both Alexander and Bagley interpreted this to mean that available educational facilities were responsible for variation between states.

Thorndike considered this same problem in his *Education as*

Cause and as Symptom (1937). On the basis of obtained correlations, Thorndike allocated most of the variation in "G" score to factors other than educational status. Thorndike concluded that education was a relatively impotent factor in securing the good life for a community, as the very title of his book suggests.

> On the whole, the facts which I have reported probably attach less causal efficacy to schooling, home life, and special forms of training than the general opinion of educators has attached to them. They certainly do not support the promises of educational evangelists that, if all the children for a generation or two had enough education of the right sort, they would be healthy, wealthy and wise, living in peace and amity, free from vulgarity and meanness, busy with noble thoughts and deeds.
>
> If one has been nourished by the hope of reforming the world in short order by extending schooling to all to age 21 (or 61, for that matter), he will be disappointed to find that the quantity and quality of a state's schooling in 1900 caused less than 20 per cent of its welfare status in comparison with other states in 1930. If one has imagined that giving the intellectually underprivileged the advantages of a home where the parents have able minds and encourage intellect in their offspring would cause the genes of a moron to develop into a mind equal to that of the average present-day European, or cause the genes of a "dull normal" to develop into a mind able to graduate from a reputable law school, he will be disappointed to learn that differences in home life and training probably cause less than a fifth of the variation among individuals in I.Q. (255, p. 67.)

The editor of the series of which Thorndike's book was a part tersely stated the issues in the Preface: "Dr. Thorndike is convinced that the genes are more important than education." (255, Preface.)

Thorndike has been explicit in the statement of his views pertaining to various aspects of the social order. He discussed extensively such topics as relations of capital and labor, principles of ownership, social effects of advertising, distribution of charity, causation of "social evils," system of doles, and so on. His huge volume, *Human Nature and the Social Order* (1940), is the most complete statement of his views. In this volume most of the statements with social content involve psychological

principles which are usually derived from Thorndike's own experiments on learning. This interrelationship is significant because it indicates that Thorndike probably considered the data of psychology, and specifically, nature-nurture investigations, as involving a particular set of social implications.

Thorndike has always emphasized the practical implications of his scientific thinking. Practical issues, in turn have been instrumental in shaping his scientific thinking. He was foremost in the application of psychological principles to education—a fact emphasized by his professorship in educational psychology for forty years. Reciprocally, controversial educational issues have been the starting point of many of Thorndike's investigations, leading to the reaffirmation or discovery of psychological principles. For instance, the general educational belief before 1900 that training in such subjects as mathematics and classical languages enabled the student to become a better thinker in other subjects was subjected to an experimental test by Thorndike and Woodworth in 1900. The conclusion of this experiment, that the doctrine of formal discipline was incorrect, had profound consequences upon educational reform. Other problems with which Thorndike was concerned originated in the business and industrial world. Thus, in 1911, when the industrial psychology movement was in its infancy, Thorndike wrote on the "psychology of advertising." Probably the major source of Thorndike's problems, however, was the development of scientific thought.

Thorndike's general acceptance of the idea that under our present economic system the measure of the worth of an individual is found in money or wealth attainments,[1] probably suggested to him a method of measuring individual ability and wants. In 1912 he wrote:

> The mere fact that the world pays a money-price for a quality is nothing against this quality. It is only because people in general are

[1] Proof for this statement is given in many of the quotations cited in this section.

stupid, and because the great benefactors of mankind do not drive hard bargains, that the really valuable service is ill paid. . . . The more rational human beings become the more will the money-price approximate the real value, in cases where the thing can be bought and sold at all. (246, p. 123.)

That money price is a measure of ability is brought out in the following view also expressed in 1912:

It has been unfashionable, particularly in high schools and colleges, to teach anything because it has a sure utility to the world measured by a money-price. The graduate who has learned nothing for which the world will pay may in a few rare cases be a great scientist or poet or social reformer, but he will far more often be a mere incompetent. (246, p. 22.)

In many of his investigations of the 1930's on the distribution of human wants and abilities the idea that money price is an adequate measure is fundamental (257, pp. 152 f.).

Thorndike's political thinking is consistent with a *laissez faire* philosophy. This strain in his political thinking probably stems from his explicit acceptance of part of Herbert Spencer's philosophy (257, p. 466). Part of Thorndike's outlook involved the acceptance of the idea that the social order is essentially fair. In 1940 he wrote that

The poor in civilized countries now receive very much better value from the world than they give to it so far as purchasable goods and services are concerned. On the whole, modern civilization has been beneficent to the poor, and its failure to prevent various misuses of law in question is, like its failure to prevent various misuses of automobiles, printing-presses, bands, labor-unions, morphine, democracy, and other useful inventions, in some ways a relatively unimportant matter.

It is well to remind ourselves that this social order, which also permits many gangsters and racketeers to terrorize whole neighborhoods and industries, many robbers and bums to live off the decent and industrious, many feebleminded to commit arson for pleasure, many mothers to pawn their children's clothes in order to get drunk, and many fathers to use their children as means of sex-gratification, is nearly or quite as good as any that man has yet operated, and that

the difficulties may lie more in the persons themselves than in the social order by which they are managed. (257, p. 956.)

The unemployed, according to Thorndike, should realize that periods of "lean years" follow those of prosperity. Consequently, they should be "frugal" during prosperous periods in order to be able to maintain themselves during the lean periods (275, p. 491). The failure of many of the unemployed to save during prosperity implies, therefore, a partial responsibility for subsequent hardships. Thorndike's attitude that the "world does not owe everyone a living" is an expression of the same viewpoint (252). In effect, Thorndike is asserting that the present money measure of a commodity or an ability is a just measure of its value in our society. The idea of a "just price" is evident in his view that "certain powerful labor unions attain a certain degree of monopoly and hold wages far above what men of similar ability and training receive in general. But this is usually temporary." (257, p. 658.)

In a discussion of rulers, Thorndike favored an intellectual aristocracy. In a comparison of our present economic system with those projected by reformers, Thorndike suggested that the capitalistic system is closest to the ideal of an intellectual aristocracy. In our economic system, the "able" are to be found among "entrepreneurs," "men of affairs," and "capitalists." In 1940 he wrote, "Psychology supports economics in its general emphasis on the advantages of having those own the instruments of production who can use them well and the relative unimportance of minor injustices and immoralities." (257, p. 689.) Individuals in authority are of higher average intelligence and morality than those whom they direct or manage. Thus it is that Thorndike wrote, immediately after the first World War, that "it has paid the masses to be ruled by intelligence." (251, p. 235.) With explicit reference to capitalism and to psychological experimentation, he wrote:

> Capitalism has the very great merit of using rewards rather than punishments as its main motives. Recent psychological experiments

reinforce very strongly the argument that freedom of contract is superior to coercion by either custom or government. (257, p. 701.)

With regard to the possibilities of democracy Thorndike was quite critical and pessimistic. Universal suffrage, and humanitarian ideals embodied in the notion of social justice usually considered as aspects of democracy, were unacceptable to him (257, p. 952). It was easy for Thorndike to be critical of the democratic concept for he equated democracy to the actual workings of present political systems. In 1943 he wrote, "In a democracy the will of the majority operates by means of, or at times in spite of, parties, party bosses, committees and active members. . . . The representatives operate by means of, or in spite of, coalitions, blocs, trading, propaganda." (259, p. 105.) The same attitude underlies his discussion of "methods of selecting rulers."

The great bulk of people do not wish to rule. . . . They let the bosses rule rather than trouble to attend the primaries, find out what is happening, and influence the course of events political. When a totalitarian state replaces a democracy so that their votes are ineffective, many of them vote as happily as before. (257, p. 791.)

Even individuals favoring the democratic concept might admit that there is much validity to Thorndike's views, but they would maintain that such malpractices indicate an imperfect democracy and could be eliminated by the proper sort of education. To Thorndike, however, educational channels were not very efficacious means of correcting malpractices. Existing defects, according to Thorndike, are the result of man's nature—hence Thorndike's faith in eugenic reform (249). To those individuals in the 1930's who placed faith in "government intervention" for the purpose of mollifying the effects of economic vicissitudes, very little sustaining support could be found in Thorndike's outlook. Some of Thorndike's most extreme utterances have been directed against "government intervention." (cf. 257, p. 674.)

Implicit in Thorndike's writings is a government constituted

along class lines. The two views—(*a*) educational opportunity and political and economic power should be distributed unequally to favor the intelligent and the moral and (*b*) the "upper classes" contain the larger proportion of the intelligent and the good—definitely imply that superior political, and other forms of power should reside in the "upper classes." In expressing this view explicitly, he leaned strongly on P. Sorokin's *Social Mobility* (1927), a book from which he quoted *in extenso.*

In the chapter entitled "Social Stratification and Intelligence and Other Mental Characteristics," Sorokin presents various lines of evidence which he interprets to mean that "the more intelligent part of the population rises to the upper strata and tends to concentrate principally in upper classes while the mentally inferior gravitates to and tends to concentrate principally in the lower social layers." (212, p. 304.) Sorokin also makes the point that the "upper classes" decay when they become dominated with "humanitarian ideas." (212, pp. 308 f.) To maintain power, considered as an intellectual question, the "upper classes" must resort to "insincerity, cynicism, manipulation of ideas and convictions." (212, pp. 308 f.) In accepting these views, Thorndike wrote:

> If this characterization is essentially true one moral would seem to be that if the able and good wish to rule the world to its advantage they must not only spend the time and trouble necessary to exert pressure within the real government by serving people as the bosses serve them and directing selections and elections through a "machine," but also conduct a "strong" government, using ruthlessly whatever means the end justifies. (257, p. 596.)

Aside from the merits of the foregoing analysis, it is clear that Thorndike's comment on the behavior of the "able and the good" is an evaluative judgment. The methods of maintaining power can hardly be classed, according to contemporary standards, as moral behavior, an interpretation which Sorokin himself supports. But Thorndike has always emphasized the inherent relationship between intellect and morality and has maintained

that the able and the good usually act for the common welfare (252). Obviously this is at variance with the above quoted comment of Thorndike in which he urges that the able and the good resort to immoral measures in order to maintain their advantage. Furthermore, since the able and the good admittedly preponderate in the "upper classes" Thorndike is, in effect, urging a type of society constructed along "class lines." This particular interpretation receives further evidence from the fact that Thorndike disposes of those "methods of selecting rulers" which favor "selection by majorities." (257, pp. 791 f.)

In brief, Thorndike can be classified as a hereditarian with regard to nature-nurture issues and a conservative with regard to social and political questions.

HENRY H. GODDARD *1866–*

GODDARD, A STUDENT of psychology under Hall at Clark University, was long interested in questions pertaining to the growing child. His position as director of the department of research of the Training School for Feeble-Minded Children, Vineland, New Jersey (1906–18), provided him with the basic data for his many studies on the feeble-minded. Goddard was the first to introduce the Binet test in America and to use it for the purpose of classifying mentally defective children. His books, *The Kallikak Family* (1913) and *Feeble-Mindedness: Its Causes and Consequences* (1914), brought him international renown. *The Kallikak Family* was much quoted by eugenists in support of their views on the importance of heredity. The latter volume was a standard reference for proof of the Mendelian character of feeble-mindedness. He is responsible for the introduction of the term "moron" into psychology as a scientific concept (1909).

Goddard's theme, which he developed in several books, involved the concept of "mental levels." In elaborating on the meaning of this concept Goddard maintained that individuals, as the result of innate factors, reached a certain level of intelligence which could not be altered by environment (107). This notion of mental levels, which he considered to be a direct deduction from the facts of mental testing, combined with the thoroughgoing acceptance of the idea that intelligence tests measure "inborn capacity" and "not attention, or memory, or reasoning, or any other thing," of necessity led Goddard to emphasize heredity and to minimize the role of environment (106, p. 261). His emphasis on heredity is indicated by the doctrine

of mental levels, the belief that feeble-mindedness was inherited and that it was responsible for crime, and by the idea that prostitution, pauperism, disease, and so on, were effects of low intelligence (104; 108).

There were two separate ideas which Goddard considered to be equivalent: inheritance of various physical and mental characteristics, and the unmodifiability of that which has been inherited. This equivalence is brought out in his discussion of the relations between feeble-mindedness and criminality. Thus, in an article in 1920, which he hoped would help decide policy toward criminals, he wrote:

> Recent developments in criminology lead inevitably not only to the idea that treatment of the offender for the purpose of reforming is impracticable but also rather definitely to the logical conclusion that in a large proportion of the cases it is impossible, impossible not from the nature of the crime but from the nature of the criminal, not on account of the strength of the habit that may have been formed, but on account of the weakness of the mentality and consequent inability to correct any habit. (108, p. 426.)

Consistent with his attitude on the essential unmodifiability of the criminal, he urged "rough and ready" methods for dealing with the criminal (108, p. 432). In his *Kallikak Family* he expressed the same idea but with reference to a different class of individuals:

> A study of it will help to account for the conviction we have that no amount of work in the slums or removing the slums from our cities will ever be successful until we take care of those who make the slums what they are. . . . If all the slum districts of our cities were removed tomorrow and model tenements built in their places, we would still have slums in a week's time, because we have these mentally defective people who can never be taught to live otherwise than as they have been living. (105, p. 70.)

This last quotation may, in addition, be taken as an example of his concept of mental levels—individuals of a given mental level can only function in an environment which is an expression of that level.

Goddard's acceptance of Mendelian notions of inheritance, undoubtedly an influence of Davenport, served to place emphasis upon the unmodifiability of innate characters. Goddard considered feeble-mindedness to be a recessive trait and "normal intelligence" to be a dominant character (102, Chap. 7). It is not surprising, then, to find that Goddard conceived of the feeble-minded as a different strain of humans. That he had this in mind is borne out by his view that "the feeble-minded stock may be primitive and possessed of much animal strength" or that "we come back again to the view of a more primitive form of humanity, a vigorous animal organism of low intellect but strong physique—the wild man of today." (102, p. 508.) Such an attitude toward feeble-mindedness, no longer entertained today, made it difficult to think feeble-mindedness as anything other than an "incurable" condition. The modern view, now accepted by Goddard, does not place the same stress upon the ineducability of the feeble-minded (109).

The idea that "stigmata," such as a drooping jaw or glazed expression in the eyes, mark the feeble-minded is consistent with the Mendelian conception underlying Goddard's work. This is evident in Goddard's observation that experts are able "to recognize them almost at a glance. Every superintendent of an institution for the feeble-minded can do this, and so can the other officers and the teachers." (103, p. xviii.) The Binet method, he continued, corroborates this impressionistic classification so that "either one is entirely satisfactory." (103, p. xviii.) This method of detecting the feeble-minded which underlies, in part, the collection of the data upon which both of his books on the feeble-minded are based, is a faulty one. A few quotations, not at all atypical, from his *Kallikak Family* will make this clear. In the description of one case, he says, "Three children, scantily clad and with shoes that would barely hold together, stood about with drooping jaws and the unmistakable look of the feeble-minded." (105, p. 77.) In another case, "a glance sufficed to establish his mentality which was low. The

whole family was a living demonstration of the futility of trying to make desirable citizens from defective stock through making and enforcing compulsory education laws." (105; p. 78.) In a series of sketches that Goddard presented in order to "enable the reader to judge of the reliability of the data" as collected on the field, the highly subjective character of the procedure is brought out. For instance, the field worker noted that

> there was no fire in their eyes, but a languid dreamy look, which was partly due, no doubt, to unwholesome city environment. . . . Stagnation was the word written in large characters over everything. Benumbed by this display of human degeneracy, the field worker went out into the icy street. (105, p. 71.)

These quotations indicate Goddard's tendency to introduce other than strictly scientific issues into his work and to express them in a rather popular and dramatic style. In fact, Goddard admitted, in defense of his work against critics, that *The Kallikak Family* was "merely a striking illustration" of data presented in *Feeble-mindedness: Its Causes and Consequences* (110). But in this last-named volume he uses the same descriptions and methods as appear in *The Kallikak Family*. Furthermore, the book was well received by scientists as a scientific contribution to the question under discussion and should, therefore, be considered in this light. It was not until 1925 that any extensive criticism of this book appeared (169).

If the purpose of *The Kallikak Family* was to demonstrate that feeble-mindedness was inherited, in that it followed family lines, the purpose of the second volume was to demonstrate that feeble-mindedness behaved as a Mendelian recessive. It was in this sense that the latter volume was cited, forming part of the standard references on the subject. But the second volume, in addition to the ill-defined method of gathering the data, contains a statistical error which precludes any Mendelian interpretation. To prove Mendelian inheritance it was necessary, first of all, to define the various characteristics in Mendelian terms and then to show that they were inherited according to

the Mendelian ratios. In presenting the data, Goddard's tables showed a high proportion of cases, almost one half for some categories, which were not classified. These cases were not classified either because of death in infancy or because, as in most of these doubtful cases, a classification could not be made in a decisive fashion. This has been interpreted as evidence of the caution involved in making classifications. But since it was obviously unknown whether those of the unknown classifications fitted into the Mendelian picture, it could not be argued that those definitely classified could fit into a Mendelian picture, unless some circularity of reasoning was involved. However, in Goddard's procedure the tacit assumption was that those of unknown classification fell into the Mendelian pattern, which was the very thing to be proven (102, Chap. 8).

The two books were consistently practical in character and much can be understood about them from this point of view. In the final paragraph of his sequel, for example, Goddard wrote:

> In conclusion, we believe that we have demonstrated that feeble-mindedness is sufficiently prevalent to arouse the interest and attract the attention of all thotful [*sic*] people who are interested in social welfare; that it is mostly hereditary; that it underlies all our social problems; that because of these facts it is worthy the attention of our most thotful statesmen and social leaders; that much of the time and money and energy now devoted to other things may be more wisely spent in investigating the problem of feeble-mindedness; and that since feeble-mindedness is in all probability, transmitted in accordance with the Mendelian Law of heredity, the way is open for eugenic procedure which shall mean much for the future welfare of the race. (102, p. 589.)

We have gone into some detail here, first, because of the importance attached to these books in the nature-nurture controversy, and second, to bring out their essential practical character. The eugenics movement was formally organized in Great Britain in 1908. In this movement attention was called to the "menace of the feeble-minded" and to their irremediable char-

acter. With an avowed aim to educate the people to the importance of heredity in social affairs, data were adduced, sometimes in a striking way, to support this aim. Goddard's works formed part of the data.

That Goddard was not concerned simply with a scientific problem in his studies of the feeble-minded is brought out in his statement that

> The menace of the feeble-minded is not a figure of speech. It is no undue sentimentalism that assures us that we need to take care of this group of people. We need to study them very seriously and very thoroughly; we need to hunt them out in every possible place and take care of them, and see to it that they do not propagate and make the problem worse, and those who are alive today do not entail loss of life and property and moral contagion in the community by the things that they do because they are weakminded. (104, p. 271.)

A few years earlier he wrote, with regard to the policy of "colonization":

> We may reasonably hope that such a policy carefully followed will in a generation or two largely reduce our feeble-minded population, and thereby our problems of pauperism, prostitution, disease, drunkenness and crime. (101, p. 1856.)

The practical character of Goddard's thinking on these questions is sharply brought out in his political views.

Goddard's political views, which usually occur in a psychological context, are expressed in several books written in the aftermath of the first World War. Keeping this fact in mind will contribute to a proper evaluation of his views. Goddard's most ambitious attempt to interpret the social order in terms of psychological principles is contained in his *Psychology, Normal and Subnormal* (1919). In the second part of this volume Goddard is concerned with applications of principles set forth in the first part. Crucial to his interpretations are the army test results. (He was one of the first psychologists to apply these results to practical situations.) Goddard interpreted these results to mean that the average intelligence of the adult American

was that of a twelve-year-old child (106, p. 250). According to his outlook an adult with a mental age of twelve years or less was feeble-minded (106, p. 250). Thus Goddard was led to the statement that 45 per cent of the American people were either feeble-minded or in the moron class (108, p. 427). Goddard's social views rest upon the implications of these statements.

In alluding to the army test results, he wrote:

> If it is ultimately found that the intelligence of the *average man* is thirteen—instead of sixteen—it will only confirm what some are beginning to suspect; viz., that the average man can manage his affairs with only a moderate degree of prudence, can earn only a very modest living, and is vastly better off when following directions than when trying to plan for himself. In other words it will show that there is a fundamental reason for many of the conditions that we find in human society and further that much of our effort to change conditions is unintelligent because we have not understood the nature of the average man. (106, p. 236.)

He continued, a "far-reaching effect of such a discovery" is that it could be construed as "an argument against democracy." He added:

> It certainly is an argument against certain theories of democracy. Democracy means the people rule. . . . To maintain that mediocre or average intelligence should decide what is best for a group of people in their struggle for existence is manifestly absurd. We need the advice of the highest intelligence of the group, not the *average*, any more than the lowest. (106, p. 236.)

To Goddard democracy meant that "the people rule by selecting the wisest, most intelligent and most human to tell them what to do to be happy." (106, p. 237.) He restated this attitude in terms of his experience in dealing with the feeble-minded. He wrote, "The truest democracy is found in an institution for the feeble-minded and it is an aristocracy—a rule of the best." (106, p. 238.) The emphasis he placed on the doctrine of mental levels, with its meaning that people are born with a fixed potentiality which determines their status in so-

ciety, suggests that Goddard would oppose plans for most social reforms. In stating his views on this subject Goddard analyzed Edwin Markham's "The Man with the Hoe," and the painting by Millet on which it was based.

Goddard points out that the usual interpretation of the subject of Millet's painting is that he "came to his condition as the result of social conditions which held him down." (106, p. 239.) On the other hand, according to the doctrine of mental levels, Goddard draws the "conclusion that the majority of such people as the man with the hoe are where they are because of lack of intelligence. Millet's 'Man with the Hoe' is a man of arrested development—the painting is a perfect picture of an imbecile." (106, p. 239.) Here Goddard adopted again his earlier view that the feeble-minded are marked by recognizable stigmata. Stating a further implication of his concept, he wrote:

> This is a day of social uplift. Thousands of people have become interested in these social problems and are working to uplift the masses. Many of the efforts have come to naught, are coming to naught, and will continue to come to naught until this principle of mental levels is recognized. (106, p. 245.)

Goddard stated many applications of this principle. For instance, he held that low mentality determines low wages (108, p. 427). In another application, Goddard wrote that "social inefficiency" was the result of the lack of proper placement of individuals according to their level (107, p. 57).

In brief, Goddard's views on heredity place him in the category of hereditarians. Correspondingly, his attitude toward social and political issues makes him conservative.

LEWIS MADISON TERMAN *1877–*

TERMAN IS generally known for his work in standardizing the Binet test as a measure of intelligence and for the application of this test to the extended study of the characteristics of gifted children. His first revision of the Binet test (1916) served as a standard device for measuring individual intelligence until 1937, when it was replaced by another equally successful revision. Terman's work along this line, with actual applications to education and industry, has been a powerful stimulus to the development of the mental test movement in America.

A follower of the Galton tradition with its emphasis on individual differences, Terman has extended the range of this tradition through the direction of the doctoral work of many well-known psychologists. Of the twenty-two doctorates for which he was responsible up to 1932 he wrote, "It is perhaps indicative of my own concentration of interests that all but three of these theses belong in the field of individual differences." (238, p. 327.)

Terman was early interested in the question of individual differences and the allied questions of genius and precocity. His doctorate dealt with the question of "genius and stupidity" as revealed in the intellectual processes of a small group of "bright" and "stupid" boys (1906). Some of his previous studies were concerned with questions of "leadership" and "precocity." (220.) In these studies Terman was admittedly influenced by G. Stanley Hall and by E. H. Lindley who had received his doctorate under Hall. The child study movement in America, with its emphasis on the scientific study of the child through the questionnaire technique, was developed at Clark University

under the tutelage of Hall. Because of his work in child study at Clark University, Terman probably was a ready recipient to Binet's ideas on measuring the intelligence of children.

An early and enduring influence upon Terman's thinking was the pragmatic trend in America, a trend personally fostered by Hall in relation to psychology and education. Terman's acute awareness of this trend is brought out in his dissertation in a section entitled, "psychology and life." As a young scientist seeking justification of a relatively new science, he wrote, "One of the most serious problems confronting psychology is that of connecting itself with life." (221, pp. 307 f.) In continuing this trend of thought, he wrote that "humanity has a vested right to demand of the scientist now and then that he show his hand. Theory that does not some way affect life has no value." (221, pp. 307 f.)

Terman's life activities testify to the strong influence of his pragmatic evaluation of science. His interest in the hygiene of the child and the teacher, his interest in the practical applications of intelligence tests and his willingness to attack new problems of general interest, as illustrated in his studies on sex and marriage, are examples of the search for a better articulation of psychological theory with society. The broader problems of nature-nurture issues, which were a major determinant of Terman's thinking, were also perceived by him as significantly related to society (225, Chap. 1).

To the nature-nurture controversy Terman advanced the concept of a relatively invariant I.Q., in so far as the influence of existing environmental differences was concerned. This idea was expressed in many ways: "intelligence is chiefly a matter of native endowment" (231, pp. 656 f.); the I.Q. is "relatively constant" and "not easily influenced by environmental factors" (236, p. 370); in an extreme statement Terman inclined to the view that "children's intelligence quotients depend chiefly on the germ cells of their parents." (233, p. 340.) On the other hand, Terman has frequently pointed out that the I.Q. is in-

constant. For example, in his evaluation of the evidence presented in the Thirty-ninth Yearbook of the National Society for the Study of Education (1940), a yearbook which dealt with the relative influence of nature and nurture on intelligence, he wrote:

> It is unfortunate that the controversy should have become so exclusively concerned with environmental influences upon the IQ. An obtained IQ is not only subject to chance errors resulting from inadequate sampling of abilities, but also to numerous constant errors, including practice effects, negativism, or shyness, the personal equation of the examiner, and standardization errors in the test used. For these reasons an obtained IQ, as I have many times pointed out, should never be taken as a final verdict, but only as a point of departure for further investigation of a subject. (240, p. 466.)

In this last quotation it should be noted that the factors mentioned by Terman as causing I.Q. fluctuations are technical in nature and are unrelated to the question of measurable I.Q. fluctuation due to differential environmental influences. This interpretation seems to be borne out in Terman's continuation of the discussion of the question. On the following page of the same evaluation, he wrote:

> The issue is not simply whether IQ's can be influenced by differences in the environment and training. That to some degree they are so influenced, no one has ever denied. Whether in a typical American community the influence is relatively small (as I believe) or quite large (as some believe) is less important than whether it has a permanent effect upon capacity for achievement. (240, p. 467.)

Terman then cited two women (Helen Keller and Anne Sullivan) who had "suffered extreme educational deprivation" in childhood but who still attained high achievement in later life. He concluded that "case histories of this kind render almost foolish the belief that intellectual potentialities are permanently affected by a little more or a little less attendance at a particular nursery school." (240, p. 467.)

The notion of a relatively constant I.Q. underlies Terman's interpretation of his widely quoted results on the stratification

of the intelligence quotients of children according to parental occupation. This stratification, he held, corresponded to the average differences of the innate potentialities of the children, and, ultimately of their parents (234, p. 66). Thus, in a chapter entitled "Relation of Intelligence to Social Status" (1917), Terman wrote, after considering various lines of evidence:

> After all, does not common observation teach us that, in the main, native qualities of intellect and character, rather than chance, determine the social class to which a family belongs? From what is already known about heredity should we not naturally expect to find the children of well-to-do, cultured, and successful parents better endowed than the children who have been reared in slums and poverty? An affirmative answer to the above question is suggested by nearly all the available scientific evidence. (226, p. 99.)

Terman's adherence to a hereditarian preconception is also brought out in a statement of his "credoes" (1932) in which he stated the belief that "the major differences in the intelligence test scores of certain races, as Negroes and Whites, will never be fully accounted for on the environmentalist hypothesis." (238, p. 28.) On the other hand, Terman wrote in 1948, "I still strongly suspect the existence of race differences, but I am now inclined to think that they may be less than I formerly believed them to be." (241.)

It should be mentioned that in his various discussions of intellectual differences among groups classified according to race or social status Terman usually emphasized the magnitude of overlap. It should be borne in mind that in all his discussions pertaining to the nature-nurture controversy Terman never regarded the controversy as closed. Despite his definite stand, he continually pointed out the incompleteness of the evidence and the necessity for further research. Furthermore, it should be noted that Terman inclined toward environmentalism in his books on school hygiene. For example, tuberculosis was interpreted by him (1914) as "largely a social and educational problem." (224, p. 128.) With regard to the probability of

success of highly intelligent individuals, Terman placed some stress upon the role of chance or accident (232).

The logic of Terman's position partly depends on the acceptance of the assumption that all individuals who come within the scope of the test standardization have had equal opportunities to gain the necessary experience to deal with the test situations (237). It is in this vein that he claims that "mere schooling" affects the vocabulary score on the Stanford-Binet but "little, very little." (233, p. 39.) Actually, what Terman has in mind is the effect of schooling on differences in vocabulary scores and not the total score itself, for it is patent that vocabulary, as achievement, is strongly affected by schooling. If the assumption is a valid one, then the differences that emerge on a test cannot be easily ascribed to environmental factors. But at the time he was writing, this assumption had not been validated. Some critics of the hereditarian school called this assumption into question and considered it a significant part of the controversy (178; 218). From a logical standpoint, Terman's tacit adherence to the validity of this assumption is consistent with his more or less explicit position that an intelligence test would be invalidated if unduly influenced by environment (226, p. 302).

Over the years Terman's position with regard to nature-nurture issues has changed somewhat, especially in so far as the influence of personality factors is concerned. Where he had previously accepted the view that a low intelligence quotient was largely responsible for delinquency, he now acknowledged that this association had been overemphasized by psychologists and consequently sought the crucial factors in the personality and emotional aspects of the individual (235; 237).

As mentioned previously, Terman's outlook was consistently directed along practical lines. Furthermore, he was also consistently aware of various social issues and their possible solution by science. This social awareness, quite evident in his early discussion of leadership and genius, is particularly clear in his

discussion of the influence of the pragmatic movement upon educational doctrine (1909). In an article, suggestive of his later views, entitled "Commercialism: the Educator's Bugbear" (1909), Terman thought that the movement toward industrial and vocational education was in line with the latest developments in educational and psychological theory and did not necessarily reflect the influence of the "spirit of commercialism." In stating another reason for industrial and vocational education, Terman further revealed his social awareness (not without some conservative implications):

> It would be altogether calamitous were our youth to receive an education so exclusively "disciplinary," or "cultural," that their practical tendencies were thereby blunted.
>
> In Germany there is the rather anomalous problem of an *educated proletariat.* Thousands of graduates from the classical *Gymnasien,* which for the most part ignore the problems of real life, find themselves misfits in the industrial and political world and drift about discontentedly until finally they contribute to swell the now formidable army of German socialists. Through the influence of the energetic emperor, the *Realschulen* are coming in to mend the situation, though they have to fight for every inch of ground they gain. But in this country our more practical sense has brought it about that few of our secondary schools dish out the formal studies to all indiscriminately. The result is that our high-school graduate more frequently finds a place in the world where he can expend his energies, not only to his own profit, but to the advantage of society as well. Indeed it would be greatly to the credit of our secondary educational system to bridge even more successfully than has yet been done the chasm that has always existed between school and life. Education, for most youths, should be an apprenticeship suitable for a busy practical life. When it becomes that, then its influence instead of stopping with the close of student days, will continue with increasing momentum. (222, pp. 194 f.)

Terman's view on a restricted education for most people, in the sense of urging an industrial and vocational type of education for the majority, as he seems to imply in the preceding paragraph, is consistent with his unflattering appraisal of the learning capacity of man (223). With the advent of the mental

test movement, with its focus on the intelligence quotient, Terman and his school brought forth evidence to indicate that individuals of low I.Q. were proscribed in their educational and industrial possibilities. This point of view is advanced in an article entitled "Adventures in Stupidity: a Partial Analysis of the Intellectual Inferiority of a College Student" (1922). This article represents a descriptive analysis of the intellectual functioning and school failures of a freshman student of age 20 and mental age 12½ (his mental age thus gives him an I.Q. of about 80). With regard to some of his many shortcomings, Terman wrote that this youth could not read a newspaper, could not follow extended directions, could not be creative, and was weak in constructive imagination (228, pp. 35 f.). The implications of this description of the subnormal youth were both political and industrial. Terman thought that the abilities of this young man lent themselves to some occupation stressing manual skill. With regard to the political thinking of this young man, Terman wrote:

> As a voter, he will never glimpse the fundamental problems relating to taxation, tariff, government ownership, systems of credit, education, labor or capital. If he ever concerns himself at all with political matters, it will probably be as a loyal adherent to his party and a devout repeater of its catchwords. (228, p. 40.)

In this analysis of the particular young man Terman seemed to describe the many people just at average or slightly below average intelligence, and the majority of individuals classified in some particular national or racial categories. He wrote:

> The details of K's [the identifying name given the youth by Terman] test performances have not been set forth merely as amusing illustrations of intellectual gaucherie. Let us see what light they throw on the psychology of stupidity, for the essential nature of intelligence or stupidity is best grasped by thoughtful observations of the bright or dull mind in action.
>
> First, however, it will be well to note that the degree of stupidity with which we are here concerned is really not extreme. K is in fact only moderately less dull than the average of the genus homo,

judging from the intelligence scores made by nearly two million soldiers. His intelligence is probably not equalled or exceeded by more than 70 per cent of our white voters, by more than 50 to 60 per cent of semi-skilled laborers, by more than 40 to 50 per cent of barbers or teamsters, or by more than 20 to 30 per cent of our South Italian or by more than 20 to 30 per cent of our Mexican immigrants. Compared to the average American Negro, K is intellectually gifted, being equalled by probably not more than 10 to 15 per cent of that race. Among the Jukes, Kallikaks, Pineys or Hill Folk, he would represent the aristocracy of intellect. Just as we are prone to forget how the other half lives, so we are equally likely to forget how the other half thinks. It is now fairly well established that the strictly median individual of our population meets with little success in dealing with abstractions more difficult than those represented in a typical course of study for eighth grade pupils, that the large majority of high-school graduates are drawn from the best 25 per cent of the population, and that the typical university graduate ranks in intellectual endowment well within the top 10 per cent. (228, pp. 34 f.)

The position expressed in this quotation was interpreted by some educators as antidemocratic in implication (27, Part IV). The maladaptability of the dull in conjunction with their fertility was the basis of Terman's belief in the relative unimportance of political institutions as contrasted with biological potentialities. In an article (1922), with a section entitled "the birth-rate differential," Terman noted that "the average feeble-minded individual leaves two or three times as many offspring as the average college graduate." (231, p. 658.) With this in mind, he wrote:

> As a nation we are faced with no other issue of comparable importance. It is a question of national survival or national decay. Unconscious of the danger that impends we haggle over matters of governmental policy that are infinitesimally trivial in comparison with the problem of differential fecundity. The situation will not be fully grasped until we have come to think more in terms of individual differences and intelligence quotients. (231, p. 658.)

The position expressed in this quotation is sometimes interpreted as indicative of a conservative orientation (209, Chap. 17).

The notion of a constant intelligence quotient, coupled with the results of intelligence tests (results which received wide attention in the period 1919–25) which demonstrated test differences among various segments of the population classified according to nationality, race, and occupation, was interpreted by critics as being inconsistent with traditional ideas of democracy (4; 6). One such idea that was thought to be at stake, for instance, was the belief in the essential equality of all, irrespective of background.

Terman's explicit position reinforced the notion that psychology and democracy were antithetical. In 1922, in a discussion of the "new approach to the study of genius" through intelligence tests, he wrote:

> Until our knowledge of the social significance of genius has been made more exact, our conception of democracy will remain an illogical patch-work. Until an appreciation of the extent and meaning of individual differences has become more general, the eugenics movement will remain a futile hobby of a handful of enthusiasts, the present unfavorable birthrate will continue, and for want of creative thinkers and doers, the struggle of civilization will be, not to advance, but to hold its own against a relatively increasing spawn of inferior mentality. (227, p. 318.)

Or as he once phrased the antithesis, democracy "should square itself with the demonstrable facts of biological and psychological science" (229, p. 62), a statement to which Bagley took strong exception (4).

To Terman's way of thinking the prevalent notion of democracy assumed that all men were born biologically equal (with the possible exception of the extremes, the feeble-minded and the brilliant). Certainly, to this notion of democracy the results of intelligence testing were quite relevant. Terman thought that this notion of democracy should be replaced by the notion of equality of opportunity, a notion that was consistent with both psychology and sentiment.

It was in this vein that Terman argued in his controversy with the journalist Walter Lippmann (230). Lippmann, however, de-

nied that he held the conception of democracy that Terman attributed to him (143). Within the scope of the same controversy John Dewey asserted that no major philosophical thinker assumed the truth of the biological equality of man (77; 78). Thus, in a sense, Terman was arguing against a straw man.

It is possible that Terman's conception of the prevalent notion of democracy was at the basis of one of his "credoes" (1922) that "on the whole, I am inclined to be pessimistic about present trends in democracy." (238, p. 330.) Thus far only the evidence available in print up to about 1940 was utilized in an attempt to evaluate Terman's social, economic, and political position—evidence which seems to indicate a conservative orientation and which was so interpreted by some individuals. Fortunately, however, a recent precise written statement of Terman's social, economic, and political attitudes is available (March, 1948), and this will be given here practically in toto.

I grew up a Republican, but in my voting habits soon became an independent. For example, I voted for Wilson in 1912, for Franklin Roosevelt in 1932, 1936, and 1944, and for Willkie in 1940. Among present presidential possibilities, I would put Vandenberg or Stassen first and (not counting the impossible Wallace) I would put conservative Taft last.

As for political ideology, I hate every form of national totalitarianism, whether of the Stalin, Hitler, Mussolini, Franco, Peron, or Japanese variety. I contributed money to the Spanish Loyalist cause. I favored stopping Mussolini in 1935 and Hitler in 1938, by force if necessary. Long before Pearl Harbor I favored an embargo on shipment of oil and steel to Japan. I favor the European Recovery plan now before Congress as the best means of stopping the westward march of soviet totalitarianism; and I favor giving such aid without regard to present socialization trends in the countries of Western Europe.

Though I am not a socialist, I am not afraid of the partial socialization now operating in Britain or Sweden, or Norway. I don't believe with Hayek that every move in that direction necessarily carries us further on the road to serfdom. We have socialized education, and for 35 years I have believed that every argument for socialized education is valid, also for socialized medicine. In one of my early books

on child hygiene I deplored the fact that many in the medical profession seemed to regard disease as a resource to be conserved for their financial benefit rather than as an evil to be got rid of.

I am emphatically not a free-enterpriser of the NAM variety. I favor social and economic planning. I would like to see the country blanketed with TVA's. I favor federal soil-and-forest conservation, and increased federal aid to education. I believe in stiff inheritance taxes, old-age pensions, social security measures, unemployment insurance, minimum wage laws, and the enforcement of fair-employment practices. I believe in federal price controls, within limits, even in peace time. I believe in the necessity of labor unions and oppose the article in the Taft-Hartley labor law which forbids unions to expend funds to influence elections.

Most of all, I believe in civil liberties of the kind supposedly guaranteed by the Bill of Rights. Our failure to insure those rights to minority groups I consider a national disgrace. Nothing disturbs me more than our widespread racial and religious discrimination. I believe in universal suffrage without regard to race, property, or political faith, and I would extend it down to the age of 18 years.

I believe in complete freedom of speech and of the press except for such minimum limitations as are absolutely necessary for national security in our troubled world.

I hated the Dies committee and I detest even more the witch-hunting and character-smearing activities of the Thomas congressional committee and the Tenney committee in California. To me they are about the most un-American thing in the USA. I feel so strongly about such threats to civil rights that if called before one of these committees I would go to jail rather than answer any questions about my political beliefs or affiliations. (241.)

In Terman's statement of his beliefs it is to be noted that the tendency is to stress those questions which became dominant in American life in the depression years. In terms of the hypothesis of this study, then, Terman as a hereditarian, could be classified (on the basis of the available evidence) as a conservative up to the beginning of the depression. However, in the over-all picture, Terman represents a contradiction to the hypothesis—as a generally consistent hereditarian he maintains strong liberal views.

PAUL POPENOE *1888–*

POPENOE, THE POPULAR national lecturer on sex and marriage, was an early adherent of the eugenics movement. He was a biologist, and he edited the *Journal of Heredity* from 1913 to 1917. His textbook, *Applied Eugenics* (1918),[1] was perhaps the first textbook published on the subject and is still used as a standard reference. For eleven years he was secretary and director of research of the Human Betterment Foundation, a Californian organization devoted to the dissemination of eugenic ideas. He is the founder and director of the Institute of Family Relations, an organization devoted to advising individuals in their marital problems. Exposition of the eugenic standpoint is the unifying factor in his diverse activities as editor, writer, biologist, and lecturer.

As an exponent of eugenics, Popenoe stressed those findings of psychology and biology which supported the hereditarian point of view. For instance, in 1922, in a review of the educational limitations implied by the army intelligence test results, he wrote:

> The conclusion that differences in mental ability, as measured by modern intelligence tests, are innate and germinal, and that they represent not differences in education and environment, so much as differences of heredity, seems sound.
>
> This fact of inherited mental differences is the very foundation of eugenics. Its confirmation with such a large body of material is of the greatest importance. Henceforth, those who advocate any method of permanent race betterment not based on eugenics can only plead indifference to facts. (204, p. 190.)

This hereditarian interpretation of the army test results is only a particular instance of his prevailing outlook. In an edi-

[1] Roswell Johnson was the coauthor.

torial to the *Journal of Heredity* entitled "Nature or Nurture?" (1915), Popenoe expressed his basic point of view. Citing investigations of Galton, Pearson, Woods, and Thorndike, he concluded that the "influence of heredity" was "overwhelmingly predominant." (200, p. 238.) In a statement of a numerical comparison, he held that the influence of nurture is "only a fifth or perhaps a tenth that of nature—heredity." (200, p. 227.) He asserted that the "facts of biology" lead to the expectation that "heredity should be nearly all-powerful and the forces of environment slight." (200, p. 228.) Expressing the view that heritable factors are not modifiable, he wrote that if heredity is defective then it is "hardly worthwhile to improve the environment; certainly it is a waste of time if it is done with the idea of thereby improving a stream of bad heredity." (200, p. 228.) In his *Applied Eugenics* there are numerous examples of his emphasis on "inborn nature."

In a discussion on the relative importance of infection and poor environment, and inborn susceptibility in causing death from tuberculosis, Popenoe concluded, "It seems evident that whether or not one dies from tuberculosis, under present-day urban conditions, depends mainly on the kind of constitution one has inherited." (201, p. 127.) According to Popenoe, the operation of natural selection in man led to stocks resistant to tuberculosis, for those not naturally immune would succumb upon being infected. Thus he asserted, "There is no escape, then, from the conclusion that in any individual, death from tuberculosis is largely a matter of natural selection." (201, p. 127.) The rapid decline in the death rate of this disease in Massachusetts over a fifty year period, according to Popenoe, demonstrates that "weak lines of heredity were rapidly cut off." (201, p. 128.) Acknowledging that "tuberculosis is particularly fatal to the Negro race," he maintained that "despite all the efforts of medicine and sanitation, it is likely that the Negro death-rate from phthisis will continue high for some years, until what is left of the race will possess a degree of re-

sistance, or immunity, not much inferior to that of the whites among whom they live." (201, p. 130.) In his views on tuberculosis, Popenoe is expressing the notion that heredity will out. Popenoe also utilized the argument of natural selection to explain the rapid disappearance of the "aborigines of America" upon conquest by the "white man," and the "decrease of natives following the Spanish conquest of tropical America." (201, p. 131.)

In his various explanations and solutions of problems confronting contemporary society, Popenoe usually assumed a hereditarian point of view. In 1918 in an article entitled "Is War Necessary?" he offered little hope to those who strove for peaceful international relations. To him war was a "biological problem" and a "normal state." He held no hope for an "early abolition of war." (202, p. 259.) He did not particularly favor the abolition of war, even if it could be abolished, for he thought that it was necessary as a source of national energy (202, p. 259). He maintained these views despite the fact that most eugenists considered war to be dysgenic. With regard to the problem of increasing morality in the United States Popenoe maintained that this increase could be attained only through eugenics since there was a close inherited relationship between intelligence and morality (203). In 1934 he implicitly commended the eugenic measures legislated by the German government as a guide to action in other countries (207).

In Popenoe's way of thinking there was an explicit connection between aspects of the philosophy of liberalism and the nature-nurture controversy. For instance, in his *Applied Eugenics*, in the introductory paragraph of the chapter entitled "Differences Among Men," he wrote:

> While Mr. Jefferson, when he wrote into the Declaration of Independence his belief in the self-evidence of the truth that all men are created equal, may have been thinking of legal rights merely, he was expressing an opinion common among philosophers of his time.

J. J. Rousseau it was who made the idea popular, and it met with widespread acceptance for many years. It is not surprising, therefore, that the phrase has long been a favorite with the demagogue and the utopian. Even now the doctrine is by no means dead. The American educational system is based largely on this dogma, and much of the political system seems to be grounded on it. It can be seen in the tenets of labor unions, in the practice of many philanthropies—traces may be found almost anywhere one turns, in fact.

He continued:

> In view of its almost universal and unquestioned, although half unconscious, acceptance as part of the structure of society, it becomes of the utmost importance that this doctrine of human equality should be examined by scientific methods. (201, p. 75.)

After citing the results of the investigations of the Galton school, Popenoe wrote, "The evidence allows no doubt of the existence of considerable mental and physical differences between men." (201, p. 83.) With regard to the origin of these differences, Popenoe, in the final paragraph of the chapter, interpreted the evidence to imply that "the fundamental differences in men can not be due to anything that happens after they are born." (201, p. 83.)

Popenoe's orientation on social questions, partly determined by his views on Jeffersonian equality, involved the acceptance of the *status quo* as a guide to contemplated social action. This orientation is involved in the interpretation of mortality in terms of natural selection. He wrote, after some discussion:

> In general, then, one may believe that more than a half of the persons who die nowadays, die because they were not fit by nature (i.e., heredity) to survive under the conditions into which they were born. They are the victims of lethal natural selection, nearly always of the non-sustenative type. (201, p. 120.)

This statement has meaning only if it is assumed that the conditions of existence are normal, for altered conditions of existence could lead to different death rates. This fact was recognized by Popenoe when he asserted that medicine and philanthropy tend to suspend the effects of natural selection. Therefore, the as-

sumed connection between the death rate and natural selection is contingent upon a value judgment that society should remain as it is. A similar attitude prevails in Popenoe's analysis of family life and suggestions for its improvement. For instance, in his *Conservation of the Family* (1926), he wrote, "My discussion is based on the existing social and economic organization of society." (205, p. 7.)

Popenoe's conservative orientation is evident in his discussions of social, political, and economic questions from a eugenic point of view. Thus, Popenoe expresses opposition to the democratic concept (201, p. 361), to minimum wage legislation and trades unionism (201, p. 375), and to the American public educational system (206).

In summary, Popenoe can be classified as both hereditarian and conservative.

LETA S. HOLLINGWORTH *1886–1939*

LETA S. HOLLINGWORTH is known in the field of educational psychology for her work on (*a*) adolescence, (*b*) identification and utilization of the abilities of the gifted and the subnormal, (*c*) special talents and defects, and (*d*) sex differences. Her books pertaining to these topics are still considered "classics" in educational psychology. She received her doctorate from Teachers College, Columbia University, where she taught from 1916 until her untimely death in 1939. She was active in framing community policy in which she sought practical applications of educational psychology.

The identification of superior and inferior deviates and the proper utilization of their talents was an early and abiding interest of Hollingworth. There is evidence to indicate that this interest was derived from sociological considerations, rather than from theoretical considerations of pure psychology. For example, in a posthumous publication (1940), one finds:

> More and more it is realized that "the mass of men," those finding their place in the middle 50 to 60 per cent of all who are born, create no special problems for themselves, educational, social, economic, moral, or legal. As a group, men of normal (average) intelligence, the "mass of men," tend neither to create social problems, nor to solve problems created by the forces of the physical environment. It is the intellectual deviates who create for mankind the great problems of crime, dependency, unemployment, and like difficulties. (131, p. 43.)

This sentiment is a conspicuous feature in her writings. If the "minus" deviates are responsible for social problems it would be wise for society, from Hollingworth's point of view, to know whence they emanate and what can be done about

them in order to minimize their social effects. Similar considerations are involved with regard to the "plus" deviates; if it is they who are the benefactors of civilization it would be wise for society to know who they are and how to maximize their potentiality and good effects.

Hollingworth analyzes the origin of these deviates from a biological point of view—deviates represent the varying results of genetic combinations (129, p. vii). Implicit in such an interpretation is the view that environmental influences are relatively ineffective in producing deflections in the tested intellectual status of an individual. It is in this vein that she speaks of the normal distribution of intelligence as a sort of "biological law." (129, p. 39.) Her hereditarian point of view is demonstrated by (*a*) choice of an explanation in biological terms where other explanations are plausible, (*b*) interpretation of various types of data.

In her volume, *Gifted Children* she presents evidence to show that men of eminence preponderate in the upper classes and in cities. She cites the two "conflicting interpretations of the facts": (1) the interpretation popularized by Lester Ward that such agglomerations of eminence are the result of inequality of opportunity and (2) the Galtonian interpretation which explains the same facts by the principles of natural selection and the inheritance of mental abilities. Hollingworth chooses the Galtonian interpretation, that is, the hereditarian one. She mentions a difficulty involved in this interpretation. For, "If inherited ability, and not opportunity, is the primary condition of greatness, and if sisters are not great, yet have the same ancestry as their illustrious brothers, their failure must be explained on some basis other than lack of opportunity." (129, pp. 5 f.) In resuming the discussion of this difficulty in a later chapter, she concludes, after demonstrating that males and females have equal test performances, that "we must assume that there are powerful determinants of eminence besides intellect." (129, pp. 65 f.)

The "determinants" include a variety of environmental and special circumstances which affect the woman adversely. Since Hollingworth accepts the environmental hypothesis in this particular case, she should have altered her original hereditarian position which excluded the positive role of environmental opportunity upon "greatness." If her principle of explanation is accepted with regard to the position of woman, then the logic of the situation implies that the same principle may be utilized to account for differences in the production of eminence among the social and economic classes as well as differences between urban and rural groups. The fact that Hollingworth did not discuss this point shows that she did not fully perceive the logical possibilities of her stated position. Furthermore, there is an inconsistency between her position on the prepotency of heredity and the acceptance of the environmental hypothesis for a particular situation.

With regard to questions concerning the causes of intellectual differences between rural and urban groups, between Negroes and whites, and between individuals identified according to nationality, Hollingworth has consistently accepted the hereditarian position. That is, the differences obtained among the various groups reflect genetic differences (129, p. 58).

Hollingworth's theoretical position on the above questions is related to her program for educational reform. Education, she thought, should favor the gifted. Since the gifted individuals are responsible for the advance of civilization and are natural leaders, the gifted should be trained as leaders—educational programs are to be adjusted accordingly. In her thinking, the great hump of the normal curve, the "mass of men," receives no special consideration in educational plans. This, of course, is consistent with her attitude that the mass of men does not create any problems.

Hollingworth's social criticisms involve the scientific falseness of the belief that "all men are created equal" and the implications of this belief in politics and education. In the chapter

on "Organization and Curriculum" of her *Gifted Children*, she wrote:

> Because of the social attitudes induced by past utterances about democracy in this country, educators are hampered by a certain embarrassment in making frank provision for gifted children. It is felt that explicit recognition in educational policy of the facts about gifted children will give offense to a community grounded in the faith that all are equal. (129, pp. 296 f.)

She continued, revealing a possible source of motivation for some of the popular aspects of her scientific thinking, "A campaign of education in biology would be necessary in order to modify the current social philosophy, which has had for a result the policy of indiscriminate training for all alike." (129, p. 296.) She associated the literal acceptance of the "dogma" that "all men are created equal" with "humanitarianism." (129, p. vii.) This "dogma" was a factor which impeded adequate control of the feeble-minded, for

> In a democracy no one feels fully qualified to "pass upon" the biological rights of another, even though that other may pilfer his goods, contaminate his children, and be supported at his expense in prison, almshouse, or refuge. (127, p. 236.)

Hollingworth exaggerates the consequences of the cornerstone of the Declaration of Independence that "all men are created equal," especially when she asserts that the movement for compulsory education is a direct outcome of the assumed validity of this "dogma." Historians, however, in dealing with the public education movement trace its development to other factors (34; 62).

Undoubtedly, according to Hollingworth's pattern of thinking, the fact of biological inequality was inconsistent with democratic sentiments. For example, after discussing the "lower half of the distribution" and the possibilities of democracy, she wrote, "It is the politics of their presence that causes concern under a democracy; for they are enfranchised, yet without learning they are political dependents." (128, 206.) The same pattern of thinking underlies two questions that she raises:

Is it possible for education to prepare the lower half of the distribution curve for self-government? Considering recent discoveries as to the mental capacity which characterizes the lower half of the population when adult, is it possible that education will ever be able to nullify the charlatan influence of demagogues, whose appeal is to prejudice and cupidity? (128, p. 206.)

She does not provide the answers to these questions. However, the very wording of the questions suggests an answer, an answer unfavorable to the democratic concept.

Hollingworth has been explicit in the statement of her economic allegiances. She was convinced that the justness of the present economic system was assured because it was rooted in psychological and biological law.

A competitive social-economic system . . . secures the full services of the intelligent, for the common use. These services could probably not be secured in any other way, human nature being what it is. Not even intellect is likely to work hard and long for nothing. (129, p. 358.) [1]

The biological component is manifest in the following statement that she thought was the logical outcome of the facts presented in her *Gifted Children:*

One who comprehends at first hand the facts which we have endeavored to discuss in this volume, has insight in the failure of realization, which has been the common lot of various schemes proposed for economic Utopia. These schemes do not found themselves on the existing distribution of biological endowment. Their authors do not always remember that men have for their sustenance only that which they are able to obtain from the earth by mental and physical labor, and apparently they do not know that only a few men have, or ever can develop sufficient power of thinking to secure large surplus returns for their labor. The immemorial division of mankind into "lower," "middle," and "upper" classes, economically speaking, rests on a biological foundation which guarantees the stubborn permanence with which it persists in spite of all efforts to abolish it by artifice. (129, p. 360.)

Implications of the above statement concerning the underlying causes of the distribution of "wealth," "property," "in-

[1] However, in 1936 Hollingworth favored a system of scholarships for the indigent talented children (130).

come," and the "reward of intellect" are explicitly stated elsewhere (129, pp. 353 f.).

In summary, Hollingworth can be classified as both a hereditarian and a conservative.

EDWARD M. EAST *1879–1939*

AN AMERICAN GENETICIST with an established position in science, East was foremost in applying biological principles to the problems of society. This fact is outstanding, for example, in his text, written in conjunction with D. F. Jones, *Inbreeding and Outbreeding: Their Genetic and Sociological Significance* (1919). This text is essentially a contribution to biology. His volumes, *Mankind at the Crossroads* (1924) and *Heredity and Human Affairs* (1927), are devoted primarily to a popular discussion of social issues in a biological setting. His views, as a scientist, have been frequently appealed to in order to justify particular doctrines.

East's general position, in the application of biology to society, has been that of demonstrating the relevance of Malthusian doctrine. This is clearest in his *Mankind at the Crossroads.* In addition, he has emphasized the importance of heredity in understanding social issues and in framing social policy. This approach underlies all his writings on human affairs. His way of thinking is based on the conception that "social progress depends primarily upon the genetic constitution of the people of which society is composed." (83, p. 195.) In stating his ideas, East was usually critical of those studies which supported the environmentalist position, and he accepted the results of investigations which favored the hereditarian point of view (82, Chap. 2).

For instance, accepting a racist position, he interpreted the results of Boas' studies on head form of immigrants, which according to East supported the "environmentalistic dogma," in terms of the effects of "racial crossing." (82, pp. 201 ff.) In

counteracting Clarence Darrow's attack on eugenics in which Darrow espoused the environmentalist point of view, East wrote:

> There are at least 20,000,000 people in the United States—and a similar proportion in other countries—whose nervous systems are too defective for them to appreciate what is demanded of them in modern society. This goodly quota of irresponsibles are such because of their heredity. Their children will tend to be like them. And I do not see that anything satisfactory biologically can be done about it. (82, p. 237.)

In stating a similar view, in the expression of which he was influenced by the army test results, he wrote:

> The intelligence tests for that selected group of young men, our army recruits, show that 75 per cent did not have sufficient innate mentality to finish a high-school course with credit. With due allowance for rejected inferiors who did not have the chance to come up for these examinations, one is forced to conclude that less than 20 per cent of our total population is capable of understanding these facts upon the possession of which we have so prided ourselves, upon the application of which the destiny of the nation depends.
>
> Think of this matter! And remember that we live in a democracy! (82, p. 299.)

In 1931, evidently influenced by his acceptance of the army test results, East inclined to a fatalistic view of heredity. He wrote, "There is no point in trying to teach our twenty million morons to read and write. It is hardly worth while to prod another twenty million dullards through grammar school." (83, p. 188.) East fully accepted the family studies, such as those of the Kallikak Family, the Jukes, and so on, which were histories of degenerate families and which were usually cited to support the view that degeneracy was a matter of heredity (82, Chap. 12). A criticism sometimes made of these family studies was that such families were enmeshed in a bad environment and consequently it was difficult to evaluate the proper influence of either heredity or environment in the determination of degeneracy. In discussing at length Dugdale's investiga-

tion of the Jukes and its follow-up by A. H. Estabrook in 1915, East wrote:

> I have discussed this family in some detail because in spite of a widespread superficial knowledge of Dugdale's investigations, there seems to be no general appreciation of the fact that the Juke history is a history of mental defect. There was, it must be admitted, a bad environment; but this environment was genetically bad, the type which leads to inbreeding, and thence to an opportunity for the segregation of defectives, rather than bad in the sociological sense. As Estabrook remarks, "one rarely gets a bad environment where the parents are healthy and intelligent." Man makes his own environment. (82, p. 232.)

Thus, according to this statement, even though a bad environment may have an adverse effect upon the individual, this environment itself is a manifestation of the inferior genetic qualities of the individual who accepts this environment, or of his ancestors who created it. East's emphasis on heredity will also be evident in the discussion of his social views which were stated in the vocabulary of biology and demography.

As previously stated, the fundamental postulate underlying East's thinking is that social progress depends upon genetic factors—more specifically, "the progress of a people depends largely upon the upper one per cent" in the scale of genetic fitness (83, p. 190). That the genetically fit control the course of civilization in an immediate sense can be inferred from East's observation in 1931 that our "prosperity" is due to a "small group of trained men of high intelligence, the men who deal masterfully with the problems of science, art, politics, and business." (83, p. 194.) The same postulate is evident in East's assertion in 1919 that

> The Negro is a happy-go-lucky child, naturally expansive under simple conditions; oppressed by the restrictions of civilization, and unable to assume the white man's burden. He accepts his limitations; indeed, he is rather glad to have them. Only when there is white blood in his veins does he cry out against the supposed injustice of his position. (80, p. 621.)

In stating an idea of Social Darwinism, he wrote, "Among biologists a defense of private property, free enterprise, and a competition which does not interfere with the social order, is unnecessary. These things must be, in order to bring out the fittest to survive." (80, p. 623.) This statement is consistent with his view that

> Superiority is a matter of a mind and body above the average. It comes by a proper combination of genes, not by mutation. And a civilization to be worth while needs a high rather than a low average in these qualities. Now, good combinations of genes rise to the top of the social mass like cream, and when they are skimmed off by relative sterility the mass is just that much poorer. Economic worth, ability to gain a college degree, eminence, are simply general indications of genetic fitness. They are among the best criteria we have of social value. We use them not because they are absolute measures but because they are serviceable measures. (82, p. 264.)

Expressing his Malthusian outlook, he held that social and political problems have their origin in the "overstrain" resulting from overpopulation (81). Thus he was led to his fundamental suggestion for correcting the ills of society. He wrote, "The biologist therefore demands cures instead of first-aid measures. The cure, in so far as a single remedy will save, is birth-control. There is no other corrective." (82, p. 307.)

East was not very receptive to the democratic concept. Acknowledging that in the United States "the major premises of government are included in the one catchword 'democracy,'" he maintained that this was actually a "biological postulate." (82, p. 299.) Believing that the traditional interpretation of democracy required the literal acceptance of the doctrine that all men are born equal, East cited evidence to show that this doctrine was biologically incorrect. As evidence East used the army test results which purportedly demonstrated that "25 per cent of the adult population" was illiterate and that a like percentage was "inherently unqualified to pass beyond the elementary school." (82, p. 299.) Thus he asserted that "our whole governmental system is out of harmony with genetic common

sense." (82, p. 299.) In his contribution on heredity to the volume, *Biology in Human Affairs*, which he edited, East again linked biology with the social order. He wrote:

> Suppose we accept this genetic philosophy; to what practical conclusions does it drive us?
>
> In the first place, it seems to me, must come the relinquishment of our professional acceptance of Jeffersonian democracy. Men are not created equally free or essentially equivalent. . . . Sustained and, for the most part, logical action based on the doctrine of human parity has been carried out only by the Soviet Republics. The keystone of Communism is a religious acceptance of two biological errors, to wit, that all persons have the same innate intellectual equipment, and that acquired characters are inherited. (83, p. 188.)

In summary, East can be classified as a hereditarian and in favor of the *status quo*.

LESTER F. WARD *1841–1913*

LESTER F. WARD, the "first great sociologist this country produced," was attached to the government in the various capacities of clerk, botanist, geologist and paleontologist. While working for the government, he obtained his education at Columbian University (now George Washington University). In addition to his bachelor's and master's degrees, he obtained degrees in law and medicine, but he never practiced in either field because his "conscience" would not permit it. He was internationally known for his contributions to geology and botany (54). In 1906 he left government service for a professorship in sociology at Brown University. Though Ward was generally unknown to educators and psychologists, W. C. Bagley favorably discussed Ward's views on nature-nurture as expressed in his *Applied Sociology* (1906). Individuals espousing the point of view of the "laboring classes" found Ward's writings strongly appealing (267, p. 231).

Ward's sociological aims were formulated at an early date in an article entitled "The Rising School," published in the *Iconoclast* in 1870. He wrote, with regard to philosophy, that "the age of speculation has gone by." A "rising school of philosophy," based on science and following Comte, Spencer, and evolution, is taking its place. "Its aims are all utilitarian, and its principles humanitarian." The "grand object of this system" is to "reform humanity." He continued, "Education is the keynote of this sociological school of philosophers, and they intend to ring the changes upon it until all the world shall be wakened to its incalculable importance." (266, pp. 110 f.)

Ward constantly reaffirmed his belief in the necessity of a science of society, sociology, as a means of advancing human

goals through organized co-operative efforts. It is this belief which underlies his proposal for a National University and a National Academy of Social Science. Among other things, such organizations would gather facts and investigate hypotheses useful to legislators. Society, he claimed, should be willing to test the effectiveness of various proposals in actual situations (268, p. 20).

The pervasiveness of his scientific outlook is evident in his views on measurement of the mind. Of interest to educators is Ward's unpublished manuscript on education written in 1872 and originally intended for his *Dynamic Sociology*. He wrote:

> The truth is that every man's calling should be made the subject of close scientific observation and experiment. Precisely the same method should be adopted to discover what a human being is and what qualities he possesses as would be to discover the nature and proportions of an unknown substance or an unknown force. Experimental tests, multiplied repetition, varied judgment, minute inspection, careful recording; these are the means which all science employs, and without these nothing valuable can be known. Apply these to the human mind and wring out of it, its exact character and qualities, and then develop and expand it along the line which nature has marked out; thus only will you succeed in economizing mental forces and securing full return for the labor of education. (261, p. 232.)

Fundamentally, Ward's distinctive thinking arose from his efforts to combat Spencer's doctrine of *laissez faire*. Thus, his first published volumes, *Dynamic Sociology* (1882), were written "to offset Spencer's erroneous social philosophy." (54, p. 35.) His later writings indicate that his interest was still "Spencer-smashing"[1] in many of its manifestations. Ward thought that whereas the lower animals were under the control of their environment, man, on the other hand, controlled his environment. This view, to Ward, was a direct deduction from the facts of biology and psychology. Just as the individual could control his destiny through his rational faculty and

[1] E. L. Youman's phrase to describe the critics of Spencer.

efforts, society, in the same way, could and should control its environment for the good of all. The medium through which society could intelligently order its future was education. Ward was as much of an apostle of education as he was an "apostle of human progress." (267, p. 172.) The forces inherent in nature tended, through their uninterfered operation, in the direction of progress. This progress could be considerably accelerated, according to Ward, if man learnt from nature and applied the same principles to the reconstruction of society along "sociocratic" lines. Briefly, his notion of "sociocracy" is a system of organized, intelligent planning by society for the happiness of all (263, p. 313).

With regard to the problem of nature-nurture, Ward held that the production of genius and talent could be increased perhaps a "hundredfold" through control of nurture by the extension of opportunity to all (264, p. 202). The core of this thinking is summed up in his "principle of intellectual egalitarianism," a principle according to which all social classes have the same proportion of genius and men of talent (265). Undoubtedly Ward interpreted the emphasis upon heredity and the exclusion of the possibilities of environment as part of the *laissez faire* philosophy. This is brought out in a letter that Spencer sent to Ward upon receiving *Dynamic Sociology*, a letter which Ward used in order to set off his own views. Spencer wrote:

> I infer that you have a good deal more faith in the effects of right theory upon social practice than I have. The time may come when scientific conclusions will sway men's social conduct in a considerable degree. But, as you are probably aware, and as I said very emphatically when in America, I regard social progress as mainly a question of character, and not of knowledge or enlightenment. The inherited and organized natures of individuals, only little modifiable in the life of a generation, essentially determine, for the time being the type of social organization in spite of any teaching, spite even of bitter experience. (54, p. 308.)

Ward was a confirmed believer at an early age in the potency of education and environment. This is well brought out

in an entry in his diary in 1860 (213, p. 68). Ward's early experience included working on farms, in factories, and at the same time attempting to pursue his education. With this in mind, he wrote:

> Perhaps the most vivid impression that my early experience left on my mind was that of the difference between an educated and an uneducated person. I had had much to do with the uneducated, and I could not believe that the chasm between these and the educated people was due to any great extent to their inherent nature. . . . The influence of education and environmental conditions took on an ever stronger hold of me. (54, p. 30.)

In discussing the development of his thinking which underlay his *Dynamic Sociology*, a work that took fourteen years to complete, Ward referred to an "oration" on the "Importance of Intellectual Culture" which he had written in 1866. With regard to this oration, he wrote, "It reflects this long-standing view of mine that culture, or 'Education,' is everything. From that date on my ambition was to expand that idea into a book and give all my reasons in extenso." (267, p. 148.) The outcome of this "ambition" was his work, *Dynamic Sociology*. It is to be noted that Ward identified education with the full range of environmental impact—it was not limited, by any means, to the range of experience obtained in the classroom.

Ward's most complete expression of his views on nature-nurture questions is to be found in his *Applied Sociology* (1906), a book which is devoted exclusively to these questions. In this volume, he is interested in controverting Galton's "subsidiary thesis" that genius is relatively unaffected by adverse environment. Ward did not question Galton's primary hypothesis that "genius is hereditary." In order to refute the former hypothesis Ward appealed to Odin's study, *Genèse des Grands Hommes.* In this study Odin, after selecting an appropriate list of more than 600 geniuses and men of talent covering the seventeenth, eighteenth, and nineteenth centuries, investigated the conditions associated with genius. Among certain highly related conditions, Odin found that genius is related to social class,

to city life, and to education. Ward placed complete confidence in the reliability and conclusiveness of this study (268, p. 290).

Ward wished to establish the truth of his basic proposition that the expression of genius is either hampered or favored according to the type of education genius receives. Although Ward thought that he had proved this proposition, his demonstration was not convincing. Ward attached decisive importance to the fact that a good education was an invariable concomitant to productive genius (264). In fact Galton did lay stress upon the view that genius would overcome obstacles in its striving for attainment. If the education or surroundings were impoverished, Galton thought that genius, in the usual run of things, would naturally surmount them (93). The invariable concomitance of a good education with genius, a relationship which Ward sought to establish, is a sufficient refutation of Galton's view. But the determination of the validity of the basic proposition is independent of Galton's exposition. The point that Ward overlooked, vitiating his whole analysis, was the possibility of alternative explanations of this concomitance. A plausible alternative is that genius is accorded a good education because it seeks it, develops it, and profits by it. This alternative was brought early to Ward's attention by Grant Allen in a review of *Dynamic Sociology* (2).

Ward's adherence to a particular interpretation underlies his acceptance of De Candolle's view, which he quotes:

> If natural talent . . . were the sole causes that determine the career and success of men of science, there would have been infinitely more scientific men issuing from poor families than from other sources—certainly the number of savants from rich families would have been very small relative to the others—which has not been the case. (264, p. 204.)

This, however, is the basic proposition which Ward originally set out to prove. It is to be noted that his basic proposition was incapable of proof. Since achievement was the only basis then

available for selecting geniuses, there was no way of determining whether a certain proportion of those who did not achieve distinction were geniuses. Therefore, any statement with regard to purported cause is a clear indication of an underlying evaluation of this whole problem.

Fundamental to evolutionary thinking was the notion of individual differences. Ward reiterated the fact that his views on education in no way conflicted with this notion. He freely accepted the fact that men were not born equal. However, some of his statements indicate some confusion over this point. Not only did he minimize the importance of individual differences, but at times he wrote as though they were nonexistent. For example, he states the view that "almost anyone with the proper training and adequate facilities can prosecute scientific research." (264, p. 241.) In a discussion of the "power of circumstances" he writes that "the common intellects of all but the congenitally feeble-minded will hold the greatest truths that have ever been discovered." A further example can be cited:

> There are differences not only in the talents of men but also in their tastes. It is in these latter rather than in the former that they differ by nature. Almost anyone has sufficient talent to cultivate almost any field, but there is little hope of success unless the field coincides with his tastes or preferences." (264, p. 276.)

A possible source of confusion in Ward's thinking is the double meaning attached to the word "men." This word sometimes refers to men as a collection of individuals and sometimes as a sociological concept. To say that "all men are born equal" might imply that samples of men from different social classes are equal. This is clearly the interpretation that Ward sometimes attaches to the phrase. However, this does not suffice to account for some of his extreme views. This is evident from a study of Ward's last published writing.

In his last publication, Ward first presents Galton's view that ability conforms to a triangular distribution and then Ammon's

view that ability is distributed normally.[2] Ward believes that both distributions overemphasize the proportion of defectives in the population. Ward, asserting his view that ability follows a rectangular distribution, separates mankind into the normal-minded, consisting of 99.5 per cent of the population, and those that form the extremes (defectives and geniuses), consisting of the remaining 0.5 per cent of the population. Except for the extremes, Ward in effect denies the concept of individual differences (265).

It is important to note that Ward's thinking on nature-nurture questions followed nineteenth-century formulations. In that period such questions resolved themselves along the line of causation of genius. After 1900 there was a considerable accumulation of quantitative evidence (the studies of Karl Pearson and Frederick A. Woods, for example) which Ward never evaluated. Where Ward stressed qualitative differences between genius and mediocrity, psychologists, beginning with Galton, stressed continuity of ability which, of course, is embodied in the concept of the normal curve.

The following statements are corollaries of Ward's main views: wealth is not a measure of ability (263, p. 264); the propensities of man are essentially good (263, p. 114); social progress results from equalization of opportunity (263, p. 323); happiness is dependent upon external circumstances (264, p. 327); the "perfectibility of man is absolutely indefinite." (54, p. 506.)

As Ward's pronounced views on the importance of education and environment would lead one to expect, definite sociopolitical ideas were implied by his position. Since social and economic institutions form aspects of the generalized notion of environment, the transformation of men is to come through appropriate changes in institutions. To Ward, institutions would be transformed through educational processes, broadly con-

[2] Ward somewhat inaccurately describes Galton's view, for Galton subscribed to the normal type curve and not the triangular distribution.

ceived. When people are fully informed, they would naturally engage in co-operative action to ensure the good life for all. This was Ward's view. A separation of Ward's views on science and society was effected for logical purposes only. To Ward, there was a direct and immediate relationship which was always evident in his thinking. The unity of his thinking is brought out in his extemporaneous address on "Education and Progress" to the students of the Central Labour College, Oxford, in 1909. This college was an institution that appealed to members of the "laboring classes" and attempted to inform them on various issues pertaining to sociology, philosophy, and so on.

His opening remarks were ". . . I am a democrat . . . my democracy is not merely nominal, not merely political: it is a democracy which is ingrained in every fibre of my nature." He proceeded to discuss his opposition to the eugenics movement. He stated his usual attitude that the "human brain" is adequate if only it is given the necessary opportunities for development. "Social classes," he asserted, are "artificial." He continued at a later point: "You ask me, do I deny natural inequalities? Not at all. . . . The great value of human life resides in the fact that the native capacities of mankind differ." What he wishes to have is "full exercise of all . . . capacities of all mankind." Social inequality, he added, makes this impossible. In his concluding remarks he refers to the coming to power of the "fourth estate":

> What do we hear all over the world? Nothing but the subterranean roar of that great mass of mankind, infinitely larger numerically than all the other classes put together; that class is rumbling and seething and working, and coming to consciousness; and when they do come to consciousness they will take the reins of power in their hands, and then will have been abolished the last of all the social classes. (270, p. 340.)

There was an equivalence in Ward's thinking on nature-nurture questions and attitudes toward the reform of society.

Just as Ward's belief in education and opportunity dates back to his early years so too does his belief in the potentiality of the "proletariat." Ward was outspoken against those institutions which, in his perception, were trammeling the expression and growth of that potentiality. His expressed views reveal him to be a sharp critic of the *status quo.*

Ward questioned the validity of the competitive principle as a means of attaining social progress. This principle, he thought, had some validity as a description of the activities of the "animal world," but for man it was wholly inadequate because of man's highly developed "mind." In addition, when the competitive principle operated in society it led to results quite different from those anticipated by the adherents of this principle. The competitive principle involved "enormous waste" rather than efficiency and led to the growth of "monopoly" which in turn abrogated the operation of his principle (263).

The following quotation, in addition to illustrating Ward's thesis that free competition is scarcely possible in society except for the simplest operations, serves to exemplify some of Ward's analyses of institutions:

> The chief difference between employers and employed until recently has been that the former have used the rational method while the latter have used the natural method. Capital has always combined and cooperated while labor has only competed. . . . Latterly, however, labor has begun in a small way to call to its aid the psychological economy of cooperation. So strange and unexpected did this seem that it was at first looked upon as a crime against society, and many still so regard it. Indeed, all the laws of modern nations are framed on the assumption that capital naturally combines while labor naturally competes, and attempts on the part of labor to combine against capital are usually suppressed by the armed force of the state, while capitalists are protected by the civil and military authority of the state against such assumed unlawful attempts. (263, p. 264.)

Ward was opposed to the usual view of Social Darwinism that the individuals who survived in the competitive struggle were the able and the moral ones. In stating his position, he accepted

the validity of natural selection in the animal world. Then he went on to say:

> But when mind enters into the contest the character of competition is at first completely changed, and later competition itself is altogether crushed out, and while it is still the strong that survives it is a strength which comes from indirection, from deception, artfulness, cunning, and shrewdness, necessarily coupled with stunted moral qualities, and largely aided by the accident of position. (263, p. 274.)

With regard to the causation of evils, he wrote:

> The evils of society are due to the competitive system in a state of artificial inequality of intelligence, and as this state has always existed it is supposed that it always must exist. . . . All kinds of false notions prevail on the subject, such as that the only motives to industry are the fear of want and the love of gain. To some minds the idea of a state of society without competition for gain is inconceivable. . . . There are many other things to compete for besides money or wealth. (264, p. 320.)

Ward did not think that the solution to social problems lay in an "oligarchy of brains" or in a eugenics program. Rather he thought that

> The true solution of the great social problem of this age is to be found in the ultimate establishment of a genuine *people's government*, with ample power to protect society against all forms of injustice, from whatever source, coupled with a warm and dutiful regard for the true interests of each and all, the poor as well as the rich. (263, p. 329.)

In summary, it is evident that a central feature of Ward's thinking is the almost naïve belief in the power of the environment as opposed to heredity, a feature which is interrelated with his sociological aims and his liberal sociopolitical views.

CHARLES HORTON COOLEY *1864–1929*

COOLEY, one of the "Fathers" of American sociological thought, was an early critic of Galton's doctrines. His evaluations of these doctrines formed part of his sociological theory throughout his life. Independently of Lester F. Ward, Cooley wrote on the nature-nurture controversy as early as 1896. In 1897 he wrote his well-known criticism of Galton's views on the relation of genius to society. In 1910 he engaged in private correspondence with Frederick A. Woods on the nature-nurture controversy. In 1920 they resumed correspondence on the same subject, and this correspondence was published in the *Journal of Heredity*.

Cooley's position on the nature-nurture controversy was essentially formed in 1897 in his critique of Galton. He interpreted Galton's *Hereditary Genius* as follows:

> In this book the author, though concerned primarily with heredity, has found it necessary to his purpose to formulate roughly and to defend a theory of the relation between genius and fame. This theory . . . may be stated, so far as it is capable of brief statement, somewhat as follows: Fame—on the whole, and reserving the right to allow for special conditions—is a sufficient test of genius. Fame can seldom be attained without genius, and genius as a rule achieves fame. Social conditions, though sometimes important and occasionally decisive, may on the whole be regarded as disturbing forces, not at all comparable in influence to natural capacity. This is so far the case that the number of illustrious men a race is capable of producing from a given population may be used as a criterion of the ability of the race, and upon this basis comparisons may justifiably be made between races so remote from each other as the ancient Athenians and the modern English. (61, p. 122.)

In presenting his own theory Cooley maintained that "every able race probably turns out a number of greatly endowed men

many times larger than the number that attains fame." (61, p. 122.) It follows, therefore, that

> The question which, if any, of these geniuses are to achieve fame is determined by historical and social conditions, and these vary so much that the production of great men cannot justifiably be used as a criterion of the ability of races except under rare and peculiar circumstances hereafter to be specified. (61, p. 122.)

Cooley thought that "illiteracy," "underfeeding," and like factors, were important hindrances to the development of genius among a people of a given nation and a given historical period. With regard to the question of differences in the proportions of geniuses between "different countries and different times," Cooley held that the "historical tendency and the spirit of the age" were sufficiently "real and powerful to control the production of famous men." From this point of view Cooley maintained, in contradiction to Galton, that the English people were not inferior to the ancient Athenians with regard to the production of superior men. In evaluating the evidence in favor of the notion that the rise and decline of civilization was due to changes in the racial composition of the population, Cooley was not convinced that such evidence was really decisive.

> We must believe that the natural characteristics of a race are comparatively stable, and that it takes a long time, as a rule, to transform them into something quite different. Believing that we cannot explain the instances of rapid rise and decadence, of which history is full, by saying that they are due to changes in breed. (61, p, 147.)

Without denying the effects of heredity, Cooley manifested his environmentalism in a variety of situations. In a discussion of the meanings that could be attached to the phrase human nature, he wrote:

> But, in the more general sense, it is a nature whose primary trait is teachability, and so does not need to change in order to be an inexhaustible source of changing conduct and institutions. We can make it work in almost any way, if we understand it, as a clever

mechanic can mould to his will the universal laws of mass and motion. (59, p. 34.)

His favorable attitude toward the "plasticity" and "teachability" of the human being underlies his many evaluations of the causes of crime, vice and social wrongs. Contrasting his own view with that of Lombroso, he wrote in 1896 that "the criminal class is largely the result of society's bad workmanship upon fairly good material." (55, p. 403.) Unlike some psychologists who placed much stress upon an organic relationship between morality and intelligence, Cooley held that "our native traits are for the most part vague capacities which are morally indeterminate at the outset of life, and out of which, for better or worse, the most various kinds of behavior may grow." (57, p. 175.)

Cooley's attitude toward the relative importance of heredity and environment is clearly set forth in his exchange of letters with Woods, an exchange initiated by Cooley's comments on the book, *Applied Eugenics*, by Paul Popenoe and Roswell H. Johnson. With the object of effecting a synthesis between the biological and sociological points of view, Cooley raised the question: "Without doubt eugenics has as yet made a far slighter impression upon students of the social sciences than its importance entitles it to make. Why is this?" (58, p. 80.) Asserting that Galton had no conception of sociology, Cooley continued:

> I take it that the misunderstanding between biological and social science is one that can hardly be healed by an appeal to specific facts, because it rests rather on a difference in the presuppositions, the points of view, hypotheses and problems which control the perception and interpretation of facts. I seldom quarrel with the facts put forth by a eugenist, but can very often see an entirely different interpretation of them. (58, p. 80.)

Offering a "constructive suggestion" toward a "clearer fundamental theory of the underlying relation between the social and biological processes," he wrote:

> The overworking of the "nature *vs.* nurture" antithesis has done incalculable harm in giving the discussion a partisan character. It should be supplemented, I think, by the conception that there are two parallel and interrelated processes, the biological and the social, equal in importance but quite different in character, supplementary to each other and not, properly speaking, in opposition to each other at all. (58, p. 81.)

Recognition of the fact that "human heredity is, in general, far more plastic than that of the lower animals" would reconcile, according to Cooley, "the sociologist's faith in education with the eugenist's conviction of the impossibility of changing inherited traits." (58, p. 81.)

Cooley's letter, which was addressed to Paul Popenoe, was answered by Frederick A. Woods. Woods held that the problem of the relative importance of nature and nurture concerned the question of the causation of "differences." In considering given functions or traits, Woods raised the question as to whether nature or nurture had the greater effect in determining differences among individuals. Woods himself accepted the view that heredity determines most of the differences, and advocated a statistical approach to the question in order to obtain further information. In answer, however, Cooley rejected the statistical approach because he thought that such an approach involved premises which the "students of social sciences" would not accept. Generally, Cooley's position on the nature-nurture controversy was not that of evaluating the relevant evidence educed in the fields of biology and psychology but rather that of suggesting alternative explanations based upon a different conception of the premises involved. The nature of his emphasis might easily have been due to the special significance attached to the concept of "social forces" in the subject matter of sociology. This explanation, however, is incomplete, for at a time when many sociologists emphasized the doctrine of instincts in relation to society, Cooley minimized its role.

Characteristic of Cooley's thinking was his emphasis upon the

necessity to promote social change and to allocate responsibility for various conditions of society, rather than upon causal analysis. In fact, he held that the notion of cause was of limited application in sociology, chiefly because of the many interlocking factors that are involved in producing a given situation (cf. 57, Chaps. 5, 15). This outlook would favor the notion that control of a situation, in the sense of producing a desired change, is of more immediate importance than causal analysis. An element of this outlook is involved in the following statement which was asserted after a discussion of degeneracy and its causes:

> As the social surroundings of a person can be changed, and his hereditary bias cannot, it is expedient, in that vast majority of cases in which causation is obscure, to assume as a working hypothesis that the social factor is at fault, and to try by altering it to alter the person. This is more and more coming to be done in all intelligent treatment of degeneracy. (59, p. 410.)

Possibly Cooley's explicit rejection of statistics in the study of questions of interest to the sociologist and eugenist is related to this attitude (57, pp. 165 f.). A statistical analysis of the relative importance of factors involved in a given situation might be inadequate since a modification of this situation could lead to different relative weights.

Cooley conceived sociology to be of interest in so far as it advanced social progress; therefore, it would be expected that he would favor those institutional trends which would accelerate such advancement. A large section of Cooley's *Social Organization* is devoted to a defense of the democratic concept against the traditional charges that democracy is the rule of ignorance, of the inferior, of the irresponsible, and so on. In this discussion Cooley was partial to the place of the "masses" in civilization. He wrote in 1909:

> The function of leaders in defining and organizing the confused tendencies of the public mind is evident enough, but just what the masses themselves contribute is perhaps not so apparent. The thought

of the undistinguished many is, however, not less important, though necessarily less original, than that of the conspicuous few; the originality of the latter, just because it is more conspicuous, being easy to overestimate. Leadership is only salient initiative; and among the many there may well be increments of initiative which though not salient are yet momentous as a whole.

The originality of the masses is to be found not so much in formulated idea as in sentiment. In capacity to feel and trust those sentiments which it is the proper aim of social development to express, they are, perhaps, commonly superior to the more distinguished or privileged classes. The reason is that their experience usually keeps them closer to the springs of human nature, and so more under the control of its primary impulses. (56, pp. 135 f.)

This attitude is quite different from the attitude of those who emphasized the role of leaders or of distinguished individuals, in the development of civilization. Cooley had an unyielding faith in the "common man." For him, democracy was rooted in human nature (174, p. 208). In his critique of Galton in 1897 he maintained that democracy favors the development of genius and to this fact he attributed the productivity of the men of genius of Athens and Florence (61, p. 135).

In considering social evils, Cooley thought that they were largely due to factors of social organization and as such could be remedied through appropriate changes. This is clear, for example, in his discussion of poverty. To Cooley poverty was not an expression of "biological" unfitness but rather of a maladjustment between the individual and society. Rather than blame the poor for their condition Cooley thought that the "main blame for poverty must rest upon the prosperous, because they have, on the whole, far more power in the premises." (56, p. 297.) It is to be noted in this connection that Cooley is more interested in correcting the condition than in searching for the cause of it. In concluding the chapter on poverty, Cooley, expressing a faith in human nature which was in marked contrast to the views of the hereditarians, wrote:

If we give the children of the poor the right start in life, they will themselves, in most cases, develop the intelligence, initiative, self-

> control and power of organization which will enable them to look out for their own interests when they are mature. The more one thinks of these questions the more he will feel that they can only be solved by helping the weaker classes to a position where they can help themselves. (56, p. 300.)

In discussing other economic and political issues of the day Cooley spoke strongly in favor of better educational facilities for the poor, child-labor legislation, slum clearance and housing projects, and the trade-union movement (174, p. 203).

In brief, Cooley can be classified as an environmentalist and, with regard to socioeconomic issues, as a liberal.

JAMES McKEEN CATTELL *1860–1944*

JAMES MCKEEN CATTELL, the "organizer of science" in America, occupies a unique position in the history of science in general, and in the development of psychology as a science in particular. Cattell received his doctorate in psychology under Wundt, after having spent about three years in the latter's Leipzig laboratory. He studied at Johns Hopkins in 1882–83 under G. Stanley Hall, and was a fellow graduate student of John Dewey. In 1887 he lectured in psychology at the University of Cambridge, where he was influenced by Galton. In 1888 he assumed at the University of Pennsylvania the first professorship of psychology established anywhere in the world. In 1891 he was called to Columbia University as head of the division of psychology, anthropology, and philosophy. He remained at Columbia University until 1917. After his separation from Columbia University, he organized the Psychological Corporation and became its first president. Most of his experimental and statistical research, which was not very extensive, was devoted to the study of individual differences and their causation. Cattell devoted most of his energies to advancing science. He edited some of the most important scientific periodicals in America. For example, in 1894 he bought *Science*, which had just then ceased publication, from Alexander Graham Bell, and subsequently edited this journal for fifty years. He turned this journal into a highly successful venture in the way of promoting science. He was a dominant figure in the affairs of the American Association for the Advancement of Science for almost fifty years. A description of Cattell as the "organizer of science" is thus understandable.

He was responsible for the introduction of the term "mental tests," and he demonstrated the relevance of such tests to society as a whole, and to education in particular. In addition, Cattell was among the first to measure individual differences experimentally. His chief contribution to the question of heredity and environment is the study, or rather series of studies, on eminent American scientists. These studies on eminent individuals, begun in the 1880's, were influenced by the works of Galton and de Candolle. Cattell must have been influential in shaping the development of the new psychology, for he headed the Columbia University department, then the outstanding center, in the early years of scientific psychology.

Cattell's environmentalism is evident in his studies pertaining to the American men of science and his interpretations of other investigations. His conclusions in his studies on eminence were: (*a*) "wide" sectional variations in the production of scientific men, with Massachusetts the leading state; (*b*) urban superiority in contributions to men of science as compared to rural sections; (*c*) with consequent repetitions of his studies over a period of years, Massachusetts lost its predominant position—North Central and Southern states gaining in importance; (*d*) variations according to racial stock—mulattoes and Negroes contributing nothing to the advancement of science. His explanation of these data was along environmentalistic lines.

> These differences and changes the writer is disposed to attribute in the main to environment rather than to heredity. From the family stocks of Massachusetts, Michigan or Louisiana, we can obtain as many competent scientific men as we care to educate and support. (48, p. 256.)

In a criticism of Cattell's interpretations, Frederick A. Woods wrote that there was nothing in Cattell's findings "to shake one's belief in the extreme importance of heredity, or even to show that environment is the main cause of the 'direction of the performance itself.'" (281, p. 207.) Woods adduced a racial interpretation to explain why, with the exception of Vir-

ginia, "the entire country south of New York has done almost nothing in producing our greatest Americans." (281, p. 208.)

In answer, Cattell defended his original interpretation, although he admitted some doubt as to the conclusiveness of his arguments. He predicted, however, that improved conditions in the South, "may . . . produce even more scientific men per thousand of its population than New England has hitherto produced." (42, p. 209.) In his concluding remark, which briefly sums up his attitude on such questions, Cattell wrote, "What a man can do is prescribed by heredity, what he does is determined by circumstance." (42, p. 209.) In explanation of urban-rural variations he resorted to both heredity and environment; the variations were ascribed in part to the selection of superior people by the cities, and in part to the fact that cities offered superior opportunities (36).

Cattell, in contrasting his views with those of the followers of the Galton school, showed that he was aware of the socio-political implications of different emphases on the nature-nurture controversy. He wrote:

> If men of performance could only come from superior family lines, this would be a conclusive argument for a privileged class and for a hereditary aristocracy. If the congenital equipment of an individual should prescribe completely what he will accomplish in life, equality of opportunity, education, and social reform would be of no significance. Such an extreme position, though it is approached by men with so much authority as Sir Francis Galton, Professor Karl Pearson, Dr. F. A. Woods, Dr. C. B. Davenport and Professor E. L. Thorndike, is untenable. (47, p. 510.)

In a similar discussion in an article entitled "Science, Education and Democracy," Cattell maintained that his studies on American men of science showed that environmental factors were crucial (45).

Consistent with his environmentalism, Cattell urged widespread social and economic reforms in 1912. He favored socialistic proposals with emphasis upon gradual change. Some of the twenty reforms he advocated were: universal suffrage, free

medical services, minimum hours and wage laws, state subsidies for children, progressive tax on inheritances and incomes "as large as can be collected," maximum annual income for an individual of not more than $5,000 and "equality of opportunity to all." (43.) At about the same time he wrote that, owing to the applications of science, "The wealth of society is now sufficient to support adequately every child, to give it the education that opens the gateway to the career for which it is fit, to provide equality of opportunity and a true social democracy." (45, p. 156.)

An abiding feature of his reformism concerned the plight of the university professor. To Cattell, writing at the turn of the century, nothing was more deplorable than the low position of the academicians, who were largely responsible for the social and economic progress of civilization but who were ill-paid for their services. In a recurring observation, he noted that "in our competitive and capitalistic system services to an individual or corporation are paid for, often to excess, whereas services to society are paid only in the fiat currency of reputation, titles, degrees, and the like." (51, p. 8.) To Cattell the condition of "intellectual liberty" was "economic liberty." (50, p. 378.) He accordingly urged high salaries for professors, special bonuses for their children, old-age pensions and tenure (44). To implement his suggestions he sent out questionnaires to ranking professors throughout the country in order to obtain their reactions on various aspects of academic life—salaries, pensions, tenure rights, administrative control of the university, relation of the professor to the trustees of the university, academic freedom, and so on. The results of these questionnaires, Cattell's own observations, as well as contributions by outstanding scholars of the period, were published by Cattell in *University Control* (1913). This book was an effective step toward the organization of professors. In an attempt to modify the plans of the Carnegie Pension Fund, which Cattell thought were unfavorable to the professor, Cattell published his observations and ques-

tionnaire data in his book *Carnegie Pensions* (1919). Perhaps thinking that the professors could do very little as individuals, he wrote in 1914:

> It may be that the time has now come when an association of American university professors might be organized, similar to the medical and bar associations, which would be an influential force in improving the conditions under which our work is done. (46, p. 495.)

In line with this idea, Cattell was instrumental in organizing the American Association of University Professors (1915). He was responsible for instituting at Columbia University a reform in sabbatical leave arrangements which favored the professor without "independent means." (46, p. 494.)

Cattell's criticisms of current university practices were so severe that it was thought that he was opposed to the university idea. For his writings abound in such terms and ideas as "academic slavery," "academic hierarchy," "administrative autocracy," "frivolous" and destructive criticisms of university presidents, and comparison of the position of the professor with that of a "domestic servant" in which the professor comes out second best. In defense of his point of view, Cattell wrote that he favored a "democracy of scholars serving the larger democracy to which it belongs." (44, p. 62.)

As is evident from the foregoing, Cattell not only maintained beliefs concerning the nature of the social process but he also actively attempted to change its direction. This activity was not confined simply to the academic situation. As a vigorous opponent of war, he circularized Congressmen in 1917 urging them to support pending legislation which was designed to forbid sending American troops abroad, except on a voluntary basis (49). This activity led to his dismissal from Columbia University (49). In 1913 he was "compelled to resign" from an exclusive club because he had "objected to the exclusion" of one of the "world's most distinguished biologists," who was a member of a minority group (52, p. 491).

After 1905, there was a marked patterning and interrelated-

ness of Cattell's thinking on nature-nurture issues and questions dealing with the socioeconomic order. Before 1905, there is some evidence that Cattell's views were somewhat different, although there is not sufficient evidence available to warrant decisive classifications. His earlier writings indicate an inclination to emphasize heredity in the production of scientific men, and his suggestion for increasing their productivity is in a eugenic direction (38; 39). In the same period, his views on education tended in the direction of restricted opportunities. This was in marked contrast to his later views which made equality and advancement of educational opportunity a condition for the further advancement of democracy (38). The focus of his thinking appears to be that of "fitting the individual to his environment" (37)—which is a static concept. In contrast, the focus of his later thinking became that of changing the environment in order to increase individual achievement.

In the same period when Cattell inclined toward the hereditarian position, he was a distinct environmentalist in his interpretations of the development of science. Thus in 1895, in countering the claim advanced by G. Stanley Hall, who had written that he and his students were responsible for the growth of experimental psychology in America, Cattell wrote that "even those who have done the most [for the growth of psychology] are representatives of such a movement, not causes of it." (36.)

Thus, in contradiction to the problem of this study, not only was Cattell inconsistent in the expression of his views on questions pertaining to nature-nurture issues before 1905, but his beliefs on sociopolitical questions were distinctly liberal (41); and if attitudes toward educational issues are considered as expressive of an underlying orientation on broader social issues, he tended in a conservative direction (37; 38).

It is significant to note that after 1905, Cattell's views were such as to confirm the relationship between emphasis upon environment and liberal sociopolitical views. This change may be

explained by the fact that Cattell's fundamental interest, namely, the advancement of the cause of science, inclined him to advocate immediate reforms to remove those obstacles which, from his point of view, impeded the growth of science. The general importance that Cattell placed upon improvement of the social and economic position of the professor is consistent with this interpretation.

FRANZ BOAS *1858–1942*

FRANZ BOAS, the eminent American anthropologist who was in large measure responsible for the development of anthropology as a science, was born in Germany but resided in America from 1886 to the time of his death. While in Germany, he studied physics and mathematics and obtained a doctor's degree in physics. Shortly afterwards, Boas visited Baffin Land in connection with some research work in geography. This trip brought him into contact with the Eskimos, among whom he lived for two years, and this was decisive in changing his interest toward anthropology. Upon his change of residence to America, Boas spent three years, 1889–92, at Clark University, where he directed the first doctoral student in anthropology in America. Of his experiences at Clark University, he wrote, "The first stimulus to my active participation in work in physical anthropology was due to G. Stanley Hall and to the atmosphere of Clark University." (24, p. 309.) He continued, defining an important aspect of his life's work, "When I turned to the consideration of racial problems I was shocked by the formalism of the work. Nobody had tried to answer the questions why certain measurements were taken, why they were considered significant, whether they were subject to outer influences." (24, p. 309.) His basic ideas on race questions and on growth, which formed his chief contact with the nature-nurture controversy, were formulated as early as 1894. In 1911, he developed these ideas into his well-known book, *The Mind of Primitive Man*, the so-called "Magna Carta of self-respect for the 'lower races.' " (219.)

In his numerous articles on the race question, Boas' position

was usually that of scientific skepticism toward demonstrations of innate racial differences and racial inferiority and superiority. He would invariably point out the difficulties or issues which were overlooked by those who advanced such demonstrations. On occasion, Boas thought that the mental differences existing among races are due to various cultural factors (25, p. 234). However, Boas usually did not preclude the possible validity of a doctrine of racial differences, although he did think that such a doctrine was not justified in terms of the available evidence. Consequently, Boas thought that a cultural interpretation was a sufficient explanation of the facts on hand (13, p. 137). With regard to the use of intelligence tests, he usually indicated their "limitations" as measures of innate ability. For instance, after a favorable discussion of Klineberg's results pertaining to a positive relationship between I.Q. status and length of residence in New York City among Negro children, he wrote that "cultural environment is a most important factor in determining the results of the so-called intelligence tests." (19, p. 6.) According to Boas, complex activities such as behavior patterns were extremely sensitive to environmental influences (20, p. 111). Immediately following the first World War, when many thought that the new immigration formed a genetically unassimilable group, Boas insisted that evidence to prove unassimilability was quite inadequate. In this vein, he criticized Brigham's book, *A Study of American Intelligence*, for its "arbitrary" interpretations of intelligence test results of immigrant groups. To Boas, "social environment" was the crucial factor in properly interpreting intelligence-test differences of different immigrant samples (18).

Boas' research on instability of type is perhaps his most outstanding work in physical anthropology. As Boas pointed out, many anthropologists interested in making racial comparisons assumed stability of the various indices that were used as measures of racial characters, particularly of the cephalic index. It was this assumption of a stable cephalic index in varying en-

vironments that Boas undertook to analyze in his work on the head forms of immigrants and their offspring. Upon comparing measurements between immigrants and their offspring born in America, immigrants and their offspring born abroad, he found reliable statistical differences which indicated that offspring born in America diverged from parental type in the direction of the American type. In reconsidering his early work in 1938, he maintained that his conclusions were supported by H. L. Shapiro's study on the descendants of Japanese who were born in Hawaii. In reporting his conclusions, Boas wrote, "These changes do not obliterate differences between genetic types, but they show that the type as we see it contains elements that are not genetic but are expression of the influence of environment." (21, p. 523.) Acknowledging that his data were "vigorously contested," Boas considered the various objections unfounded. He wrote, "I think the evidence showing that the form of the head is susceptible to environmental influence is incontrovertible. I also believe that adequate proof has been given for modifications in the width of the face under changed conditions of life. The causes of these changes are still entirely obscure." (24, p. 59.) Throughout his discussions Boas' emphasis is on environment and "plasticity" of type.

In some discussions on racial differences, the assumption is made that the achievement of a given race expresses its genetic status. If a "lower race" did not attain the same cultural achievements as our civilization, then this was taken to mean that the "lower race" was incapable of such achievements. This type of analysis, brought into the psychological aspects of the nature-nurture controversy by Galton, was given particular prominence in the interpretations of the army test results. Furthermore, these interpretations assumed, in many cases, a practical identity of race with nationality. This tendency to identify the concept of race with that of nationality, a source of error pointed out by Boas, was given some prominence by a few psychologists and geneticists (cf. 148).

Against this assumption, which to him was "unproved," Boas consistently maintained a positive stand. For instance, in his *Mind of Primitive Man* (1911), he wrote:

> Historical events appear to have been much more potent in leading races to civilization than their faculty, and it follows that achievements of races do not warrant us in assuming that one race is more highly gifted than the other. (12, p. 17.)

In a series of popular articles on the concept of race written after the first World War, Boas made this assumption a central point of his criticisms. To Boas, cultural forms exerted a strong influence over the direction of behavior and mental functions of various peoples. Consequently, according to Boas, cultural differences were sufficient to account for differences in achievement without postulating some innate component (cf. 17).

An aspect of the same assumption pertaining to the relationship between race and culture is involved in the frequently cited "selective migration" argument. A significant result of the army tests was the superior performance of northern Negroes as compared to the southern Negroes. According to the selective migration argument, the superiority of the northern Negro was the result of the migration of the more intelligent southern Negro to the North. This interpretation assumes that demonstrated intellectual status reflects genetic status. In discussing this selective migration interpretation, as advanced by M. R. Trabue, Boas termed it an "ill-founded interpretation" since there was no evidence to support it (16, p. 389). Boas then showed the relevancy of environmental factors, such as superior educational and economic opportunities, in explaining the superiority of the northern Negro. To Boas, there was no biological or psychological justification for the belief in the intellectual inferiority of the Negro (16, p. 392). But he did not deny the possibility that future scientific work might show real differences. For instance, he wrote in 1938:

> It may be well to state here once more with some emphasis it would be erroneous to claim as proved that there are no differences in the

mental make-up of the Negro race taken as a whole and of any other race taken as a whole, and that their activities should run in exactly the same lines. (19, p. 268.)

However, even if differences were proved, there still would be no reason to believe that the Negro is incapable of fulfilling "the duties of citizenship as well as his White neighbor." (19, p. 268.)

From the modern point of view, Boas' position on the nature-nurture controversy may be described as that of an "interactionist." Accepting the laws of heredity and their applications, he held that they did not preclude the possibility of environmental influence (24, p. 25).

Boas' outlook on political issues is in concordance with his generalized anthropological point of view. In discussing the central thesis of his *Anthropology and Modern Life* (1932), he wrote:

In writing the present book I desired to show that some of the most firmly rooted opinions of our times appear from a wider point of view as prejudices, and that a knowledge of anthropology enables us to look with greater freedom at the problems confronting our civilization. (20, Preface.)

As some examples of "prejudices" he cited, "the identity of the race and nation, the superiority of the White Race, the identification of absolute ethics with our modern code of behavior, the resistance to fundamental criticism of our civilization." (20, Preface.) His "fundamental criticism" extended to the concept of "nationalism" and its teaching in schools, to "eugenics," to educational ideals and their conformance to the demands of the "imperialistic State," to marriage and to property relations (20, p. 87). Throughout these discussions Boas' point of view is that of a critic who is desirous of establishing closer adherence to democratic notions. The same point of view prevails in his posthumous collection of writings, *Race and Democratic Society* (1945).

For an educated intellectual, Boas' analysis of the role of the

"educated classes" in modern civilization is remarkable. He wrote that these classes "imbibe well the traditions of the past" thus becoming "most conservative." In contrasting the "educated classes" to the "masses," he wrote:

> It is a mistake to assume that their mentality is, on the average, appreciably higher than that of the rest of the people. . . . Their average mentality is surely in no way superior to that of the workingmen who by the conditions of their youth have been compelled to subsist on the product of their manual labor. (20, p. 196.)

According to Boas, the "masses" are less subject to "traditional teaching," and, therefore, "the desires of the masses are in a wider sense more human than those of the classes." In expressing a favorable attitude toward the "masses," he wrote:

> I feel strongly that the problem itself, as felt by them, and the ideal that they want to see realized, is a safer guide for our conduct than the ideal of the intellectual group that stand under the ban of an historical tradition that dulls their feeling for the needs of the day. (20, p. 198.)

With reference to the specific social and political trends of the day, Boas criticized university "boards of trustees" as being too far removed from the wishes of the public (1918). He was a vigorous exponent of "freedom of teaching," and was critical of those educational tendencies in America which he thought were similar to those in the Germany of 1937. In this vein he wrote, "The persecution of teachers who are supposed to be 'reds' is one of these dangers that we ought to combat." (22, p. 1.) He went on record in opposition to the Dies Committee as an "un-American institution." (23, p. 156.) It was his attitude that a "fundamental principle of American democracy is the demand for absolute freedom of opinion" and also "freedom of exchange of opinion." (23, p. 156.) In the years 1939–40 he was chairman of the American Committee for Democracy and Intellectual Freedom, an organization devoted to combating those irrational scientific notions which are used to defend undemocratic tendencies.

An early influence on the formation of his liberal sentiments may have been the fact that he was raised in a home where the "ideals of the revolution of 1848 were a living force." (26.) His parents, he noted, were "strong liberals." If this early home atmosphere influenced Boas in the direction of accepting liberal attitudes—and Boas was convinced of the importance of the early years in the development of attitudes—then this would account for his later acceptance of the environmentalistic point of view in science. Although Boas' environmentalism may have been the expression of a scientific point of view in anthropology, the fact is that not all anthropologists were of similar persuasion. It should be noted, further, that the expression or acceptance of a scientific point of view on a given class of questions is not inconsistent with an underlying emotional component.

In brief, Boas was a consistent environmentalist and a consistent liberal. There is some evidence, furthermore, to indicate that his liberal outlook antedated the acceptance of an environmentalist position in science.

WILLIAM C. BAGLEY *1874–1946*

BAGLEY, WHO IS chiefly known for his work in education, received his doctorate in psychology under Titchener at Cornell University. His dissertation was a correlational study dealing with physical and intellectual characteristics and was well received in psychology. Bagley, however, joined the rapidly growing scientific movement in education and became professor of education at Teachers College, Columbia University, in 1917, where he remained until his retirement in 1940. He then took over James McKeen Cattell's editorship of *School & Society*, which he retained until his death. In education Bagley was the outstanding exponent of the "essentialist" movement that was in opposition to the so-called "progressive" wing. Bagley's particular contribution to the nature-nurture controversy concerns his free criticism of interpretations of the army test results. In so doing he was led to consider some of the basic issues of intelligence testing. His objections were partly responsible for the reconsideration of the whole question and led to the two volumes of the National Society for the Study of Education entitled *Nature and Nurture, Their Influence upon Intelligence* (1928).

In 1911 Bagley specifically dealt with the issues of the controversy in his *Educational Values*. Considering the evidence in the field up to that time, he disagreed with "Galton's fatalistic conclusion" that heredity was the all-important factor. With reference to this attitude he wrote, "The educator is and should be predisposed to a belief in the importance of the former factor [experience]. To him the writings of the environmental school are replete with inspiration." (3, p. 104.)

The next time he wrote on the subject, ten years later, the controversy had become much more acute with regard to its implications for education. In his criticism of the army test results and their applications to education and society, Bagley was essentially protesting against the claims set forth by Lewis Madison Terman, G. M. Whipple, C. J. Cannon, G. B. Cutten, and C. C. Brigham.

The principal results of the army tests were:

(a) The average mental age of the white soldier was that of a thirteen-year-old child.
(b) 47.3 per cent of the white soldiers were classed as of low-average or inferior intelligence.
(c) States differed widely in their average scores. The average for Oregon, for example, was almost twice that of the average for Mississippi. Northern states were superior to the Southern states.
(d) 89 per cent of the Negro draft was classed as of low-average or inferior intelligence.
(e) Northern Negroes were superior to southern Negroes.
(f) For some states, the northern Negro exceeded the southern white in attained score. (170; 289.)

These results were accompanied by a hereditarian interpretation both in the official army report and in the summary of it. That is, the army tests were held to be tests largely of native ability and not educational or environmental opportunity (289). Accordingly, it was thought by some psychologists that mental growth ceased at thirteen years for the whites (about ten years for the Negroes) and that not less than 75 per cent of the American people lacked sufficient ability to finish the usual high-school course (148, p. 162). In determining educational policy, it was thought that it would be more profitable to enrich the education of the relatively few intelligent individuals rather than that of the dull majority (27, Part IV). Furthermore, the feeling was that the majority should be trained along vocational lines and taught to follow leaders (27, Part IV).

Brigham reworked the army data in order to determine the relative abilities of immigrants. In his *Study of American Intelli-*

gence (1923), Brigham was directly influenced by such racists as C. W. Gould and Madison Grant, and his book was officially sanctioned by the psychologist R. M. Yerkes (28). This book was influential in determining official legislative policy on the immigration question (142). Brigham maintained that the recent immigrant to America was less intelligent than the immigrant of some decades earlier. Furthermore, the immigrant from northern Europe was far more intelligent than the immigrant from the southern or eastern sections of Europe (the new immigration was largely from the southern and eastern sections). Brigham's standpoint was avowedly hereditarian and racist. He explained his results in terms of "Nordic blood." (28.) [1]

The army test results were seized upon by C. J. Cannon, G. B. Cutten, L. Stoddard, and others, and given antidemocratic implications. For instance, Cutten, in his inaugural address as president of Colgate University, held that democracy was now "out of the question." He argued for a "caste type of society." (63.)

Feeling that the "ideal of democracy" was at stake, Bagley called into question the assumptions and interpretations of the army results. He discounted Brigham's view that the "Army tests are trustworthy measures of native-intelligence." (7, p. 115.) He thought that the "teachings" of the hereditarians, or "determinists" as he called them, were based on "bias." For instance, he wrote,

> The current teachings of educational determinism are dangerous because they proceed with a dogmatic disregard of the possibilities of insuring progress through environmental agencies. This disregard is so studied, so pointed, as to brand the determinist as thoroughly prejudiced. (4, p. 376.)

In setting forth his own views, Bagley was well aware that he, too, was "biased." (7, p. 156.)

Bagley did not deny "differences in native mentality" but

[1] A few years later Brigham asserted that his book was faulty in its methodology and that consequently the conclusions were incorrect (29).

was concerned with their meaning for education and society (7, p. 31). He claimed that the intelligence quotient could be significantly changed by the social environment and that native individual differences, which "tend to pull men apart," could be overcome by "resemblances in ideas, ideals, aspirations and standards." (7, p. 31.) In particular, he thought that educational opportunity played an important role in producing the differences revealed by the army tests. Following H. B. Alexander, Bagley demonstrated a high correlation according to states, between educational opportunity and attained army score (7, pp. 68 f.). Although Bagley admitted that these results could be explained by a "strictly hereditarian hypothesis," he chose to interpret them according to the environmentalistic hypothesis. He explained the superior results of northern states in terms of the better educational facilities in the North. The northern Negro was better than the southern Negro by virtue of superior educational and economic advantages.

In these discussions Bagley was not simply concerned with the theoretical possibilities of an academic dispute. The position of the hereditarian he found "fatalistic." He described himself as a "rational equalitarian," and he maintained that education could be effective in raising the functioning intelligence of the people. "Recognizing racial *differences* for what they are, he builds his program upon the far more numerous *resemblances* that now exist," and, he continued, "instead of intensifying biological differentiation, he would stimulate cultural integration." (7, pp. 129 f.) His program, he claimed, was more consistent with "the ideals of humanity and democracy." (7, pp. 129 f.) On the other hand, "The hereditarian's solution of the problem is intolerant of the facts that do not support it; it is openly inhumane and blatantly anti-democratic; and to make it work would involve an upheaval beside which the late war would look like an afternoon tea." (7, p. 131.) In discussing "Galtonian fatalism," he raised the question:

What, may I ask, would have been the effect of the anti-slavery agitation if the hypothesis of an unmodifiable "general intelligence" had been current at that time? What would be the case of the universal franchise? Indeed, why not hereditary leadership and even the divine right of kings, if only these doctrines could be tempered with a little Mendelism? (4, p. 377.) [2]

In this last quotation, Bagley implies that the hereditarian point of view is inconsistent with the concept of social progress.

Bagley, in his writings on the nature-nurture controversy, was dominated by a "social orientation." The very title of his first article, "Democracy and the IQ," which provoked controversies between himself and Terman, as well as with Whipple, is indicative of this. Dubbed a "sentimentalist" by his critics, Bagley unquestioningly accepted the democratic point of view with its belief in the "collective supremacy of the common man." (4, p. 382.) Effective leadership, he thought, depended upon an educated and informed body of men. In objecting to the notion of an "intellectual aristocracy" he wrote:

I can affirm that the safest guarantee of sincere and responsible leadership is a level of informed intelligence among the rank and file that will enable the common man to choose his leaders wisely, scrutinize their programs with sagacity, and, encourage them to relinquish the duties of leadership gracefully and speedily when they go wrong. (7, p. 26.)

His attitude on the "common man" is briefly summed up in his fervent statement that "a little more light for the common man this year, next year, a hundred years from now, and the battle for humanity, for democracy, and for brotherhood is won." (7, p. 32.) The principal agency through which this would be attained was education. Hence the overwhelming importance that Bagley attached to education.

In brief, Bagley, an environmentalist, supported a "progressive" position on democracy and the "common man."

[2] Bagley was not aware that Frederick A. Woods had asserted an equivalent of this doctrine in his *Influence of Monarchs* (1913).

HERBERT S. JENNINGS *1868–1947*

THE NATURE-NURTURE VIEWS of the eminent American geneticist, Herbert S. Jennings, called a sentimental humanitarian by a fellow scientist, have been widely quoted, chiefly by the environmentalists. In his books, *Biological Basis of Human Nature* (1930) and *Prometheus* (1925), Jennings has sought to align the nature-nurture controversy as traditionally formulated (that is, as involving mutually opposed factors) to modern developments in genetics. In this reformulation his emphasis was on the side of environment.

In his *Prometheus*, Jennings deals with the "exposition of the relations of heredity and environment" as an outgrowth of the "most orthodox genetics of the straightest sect of experimental Mendelism." (134, p. 2.) Discussing the implications of popular Mendelism, which was "grotesquely inadequate and misleading," Jennings wrote:

> These facts—the relation of single packets (i.e., genes) to particular later characteristics—gave rise to a general doctrine, a philosophy of heredity and development, a doctrine which has had and still has a very great influence on general views of life. It is to this doctrine that the prevailing ideas as to the relation of heredity and environment, as to the relative powerlessness of environment, are due. But it has turned out to be a completely mistaken one. This fact has not come to general consciousness; the doctrine continues to be a source of mystification and error. Its complete disappearance would mean a very great advance in the understanding of life. (134, pp. 15 f.)

Jennings proceeded to cite experiments demonstrating the dependence of the organism upon varying environmental conditions. These experiments, according to him, proved the falsity of the old doctrine with its conception of the individual as

"pre-ordained." In a statement which expresses the "interactionist" point of view, Jennings wrote, "What part of the body a cell shall produce is not determined alone by its genes, by what it contains, but equally by the conditions surrounding it." (134, p. 36.) Maintaining the idea that heredity and environment were of equal importance in the development of the individual, he wrote:

> There is no *a priori* reason why anything that may be done by a chemical produced from an individual's own genes may not be done equally by a chemical introduced in some other way. Shortcomings due to defective genes are essentially as subject to supplement and remedy as are other defects. (134, p. 38.)

Thus, proper interpretation of Mendelism, from Jennings' point of view, does not minimize the role of environment at all, nor are heredity and environment incompatible influences.

In his *Biological Basis of Human Nature*, Jennings considered the question of the "relative importance of genetic constitution and of environment for mental diversities." (137, p. 180.) He phrased the question as follows:

> Are more of the present differences in mentality and behavior the result of original diversities in genes, or of diversities in environment: diversities in education, social status, cultural state of the society in which men live, tradition, custom and the like? (137, p. 180.)

In stating that "no one can give numerical answers to this question," Jennings held that no single, all-inclusive answer could be given. "For members of the same family," he wrote, "the differences in mentality and temperament will probably be due more largely to diversity of gene combinations than to diversity of environment." (137, p. 181.) In so far as larger and more heterogeneous groups are concerned, the "answer becomes less clear." He continued:

> In a single nation, as in the United States at the present time, there are certainly great numbers of diversities of both types; my own guess would be that the greater number of important differences are

still those due to diversity of genes. As between nations of diverse cultures and traditions, the role of these environmental factors becomes greater, possibly equaling or exceeding that of genetic differences. As between groups of mankind at different epochs of history, it may be judged that the great differences are due to just what they appear to be—differences in knowledge, in tradition, in type of culture, in the accumulation of inventions, and the like; rather than to genetic differences in the populations at different eras. (137, p. 181.)

Thus, no single answer can be given to the question pertaining to the "relative importance of heredity and environment." Jennings' environmentalism is further evident in the way he contrasts two types of errors, the one overemphasizing heredity, the other overemphasizing environment. Although there is "no need for either error," Jennings held that overemphasis on heredity is "more harmful." (137, p. 217.)

In discussions on eugenic ideas, Jennings usually indicated the inadequacies of such ideas. While not contradicting the major eugenic doctrine relating to the possibility of improving the "human breed," Jennings thought that it would be more expeditious to improve nurture factors for "what these do they can do quickly." (135, p. 11.)

With regard to the idea that civilization is harmful to the progress of the race, Jennings wrote, "There is no certainty that the invention of fire, clothing, social organization, and vaccination have not augmented the well-being and staying power of the race." (134, p. 70.) In a specific application to tuberculosis, Jennings maintained that efforts to eliminate this disease either by means of environmental control or improved medical practice do not lead to racial deterioration (136). Jennings did not deny the importance of genetic constitution but thought that "environment is probably even more important." (137, p. 147.) He conceived the possibility that further discovery may completely prevent the occurrence of tuberculosis by controlling the factor of infection and that consequently, genetic differences in susceptibility to the disease could be ignored

(137, pp. 147 f.). It is to be noted that this view of the tuberculosis problem is in marked contrast to that of the followers of the Galton school, some of whom maintained that the disease could not be eliminated through environmental measures since natural selection was the effective factor (cf. 190).

Jennings did not express himself at length on his social and political views. His available statements, however, do admit of a definite classification and are consistent with his view, as a geneticist, that "genetic factors can never be practically dealt with until the environmental factors are largely controlled; this is the teaching of most practical work in genetics." (136, p. 8.) He applied this idea to an evaluation of eugenic measures:

> Measures of public health must be carried out, overwork and bad conditions of living done away with, faults of diet, both quantitative and qualitative, corrected; economic ills conquered, grinding poverty abolished. When these things are done, when the human plant is given conditions under which it can unfold its capabilities without stunting, poisoning and mutilation by the environment, then it will be possible to discover what ills are due primarily to defective genes, and to plan such measures as are possible for their eradication. Acting on such precise knowledge, far more rapid and effective results may be hoped for than from the present blind action in merely encouraging the propagation of certain classes, discouraging that of others. (137, p. 250.)

In a previous discussion of eugenics, Jennings suggested that a difficulty with plans to breed a better race lay in the specification of the type of individual considered desirable. In actual eugenic practice, Jennings was in agreement with Bertrand Russell that the type that would be allowed to prevail would be one conforming to the ideals of "the capitalist class," a prospect which Jennings found distasteful (134, p. 81.)

In his book, *Life and Death* (1920), Jennings expressed the view that democracy, rather than aristocracy, was implied by biological doctrine (133, p. 222). Jennings explicitly stated some of his political views in a review of Alexis Carrel's book, *Man the Unknown*, under the title of "Biology and Social Reform."

(138.) According to Jennings, Carrel's book expounded the view that the remedy for social and economic ills lay in the utilization of biological principles, and that the improvement of society depended upon the production of a better race. In dissenting from these and other views, Jennings took exception to Carrel's antidemocratic statements. The aristocratic principle asserted by Carrel would, according to Jennings, "tend to secure for the book a welcome as supplying a biological philosophy for a fascist state. This may indeed turn out to be the most important feature of the work." (138, p. 160.) Jennings proceeded to give his own answer to the question posed by Carrel, "Can we agree with Carrel that the fundamental evil is that modern conditions are bringing about the degradation of the individuals that live under them?" (138, p. 161.) In presenting his own answer, Jennings traced present difficulties to various institutional factors, among which may be mentioned disagreement as to the ends to be pursued by mankind and disagreement as to what individuals are to benefit by a given course of action.

In brief, Jennings may be classified as both environmentalist and liberal.

HERMANN J. MULLER *1890–*

MULLER, THE NOBEL PRIZE WINNER (1946) in medicine and physiology, is known to psychologists principally for his work with twins in which he attempted to unravel the effects of nurture from those of nature. Indirectly he has exerted an influence on the attitudes of psychologists toward eugenic doctrine and the concept of race by formulating the so-called *Geneticists Manifesto* (1939) and by obtaining for this manifesto the signatures of twenty-one prominent English biologists. He has exerted a further influence by his work on the experimental production of mutations by X-rays (work for which he was awarded the Nobel Prize) thus creating a new situation for the evaluation of nature-nurture problems.

Muller's general scientific position with regard to the controversy is that of environmentalism. The motivation underlying his experimental work on mutations is consistent with such a position in so far as it represents a definite attempt to seek "modification of the innate nature of organisms" through the intervention of an environmental variable, namely, X-rays. Hitherto the prevailing scientific attitude regarded the fundamental units of organisms as elements whose principle of change was self-contained. If the basic elements were subject to control of man, it would not be a long step to considering psychological characteristics as similarly subject to control.

Muller has interpreted the work of psychologists to indicate the importance of environment. For example, he considers the investigations of Barbara Burks (an investigation usually cited to support a hereditarian position) and of the "Chicago School" (that of F. N. Freeman, *et al.*) as showing "clearly the im-

portant influence of environment as well as that of heredity upon intelligence as ordinarily measured." Differences between the I.Q.'s of "genetically identical twins who were reared apart," he notes, "are considerable." With regard to the question of grouping of biological variations, he wrote:

> There is no scientific basis for the conclusion that the socially lower classes, or technically less advanced races, really have a genetically inferior intellectual equipment, since the differences between their averages are, so far as our knowledge goes, to be accounted for fully by the known effects of environment. (165, p. 43.)

With regard to crime, unemployment, and slums, his position was that they were cultural products. He skeptically views intelligence tests as being "very unreliable" except where a "homogeneous environment" exists. He does not minimize the extent of individual differences nor does he deny the "influence of genes." He does not look upon nature and nurture as two opposing, mutually exclusive, entities. Recognition of the "importance of genes," he holds, does not preclude the fact that "environment also is of the utmost importance in the development of the mental structure." (166, p. 91.) His environmentalism is also indicated in the *Geneticists Manifesto,* the theme of which was that social reconstruction must precede any attempts at eugenic reconstruction (167).

With regard to social and political issues, Muller has been outspoken, accepting much in the conclusions of Marx. He was early interested in attempts at social reconstruction—in 1923 he reported on his trip to the Soviet Union in rather sympathetic terms (164). In 1933 he returned to Russia where he remained until 1937, during which time he was a senior geneticist at the Institute of Genetics at Moscow.

His views on economic and social questions are "radical." In a discussion of eugenic reform, he wrote that "fundamental economic forces" are at work which will prevent efficacious eugenic reform. From his point of view, eugenics was doomed to failure since eugenists overlooked "a principle, brought out

by Marx, that the practices of mankind, in any age, are conditioned by the economic system and material technique existing in that age." The primacy of the profit motive in our society, he thought, caused people to look upon their children in terms of a "profitable investment." If children were unprofitable, then people restricted their birth rate. It was in this spirit that he urged "economic and social revolution" as antecedent to any intelligent eugenic action, action which he does not oppose in principle. The genetic fitness of an individual is obscured in our society, according to his way of thinking, and this provides another reason for initiating a "revolution," for under conditions of environmental equality, differences that emerge would then be true measures of genetic worth (165; 166).

In summary, Muller can be classified as an environmentalist,[1] and with regard to the problems of society, a radical.

[1] In 1948, in a letter to the writer, Muller wrote, "I abhor the distinction between environmentalism and hereditarianism, or whatever it may be called, believing that the antithesis is a false one and that both schools represent one-sided views. I believe that Haldane and most other modern geneticists, if questioned, would agree that both sets of influences are of major importance and that they would refuse to be classified as either environmentalist or hereditarian." In this study the terms "environmentalist" and "hereditarian" are classificatory devices sanctioned by usage. It must be emphasized that the classification of environmentalist does not in any way imply a denial of the laws of heredity nor does it imply the unimportance of hereditary effects.

FRANK N. FREEMAN *1880–*

TRAINED IN PSYCHOLOGY, Freeman concentrated his efforts in the field of experimental education. For a period of years he reviewed the literature on mental tests for the Psychological Bulletin and his book on intelligence tests is a standard reference in the field. His connection with the nature-nurture controversy stems from his investigation, with Holzinger and Mitchell, of the influence of environment upon intelligence and also from his analysis of various data presented in his textbook.

Freeman's position on the controversy has been in the direction of emphasizing environment. This is evident in his conclusion relating to the evaluation of intellectual differences among racial, nationality, and rural-urban groups, in his *Mental Tests* (1926). Pointing out the alternative interpretations of the various group differences which have been reported, he concluded:

> Intelligence tests have made a marked advance toward the measurement of native capacity, but their scores are still influenced to a considerable degree by the effects of training and in their interpretation this influence must always be taken into account. (86, p. 475.)

Although some hereditarians could accept this statement, Freeman's view differs in that he advances or tries to show the strong influence of environment. In this respect, his textbook should be compared with that of Pintner's *Intelligence Testing* (1923) in which the same material is covered but interpreted from the hereditarian point of view. In his evaluation of the evidence presented in the 1928 Yearbook of the National Society for the Study of Education, Freeman concluded:

The preponderance of evidence appears to me to indicate beyond a doubt that the scores on intelligence tests—and hence intelligence, so far as we can measure it—are influenced to a marked degree by the character of the home and the other circumstances that go with it. While we cannot make any exact comparison between the relative amount of influence of heredity and environment, we are justified in saying that environment must be taken into account both in interpreting the scores on intelligence tests and in estimating the importance of education. (87, p. 380.)

His investigation on the influence of adoptive homes upon the development of foster children is usually interpreted as environmentalistic (92). In popularizing the results of this study Freeman claimed that this investigation provided a decisive test for demonstrating the influence of environment. With regard to the "foster children of inferior inheritance" who were placed into superior homes, he wrote:

If heredity is the sole determining factor in intelligence these children should exhibit the same intelligence as other children of similar origin. . . . The outcome of the comparison is decisive. The average intelligence quotient of 401 foster children was found to be 97.5 . . . the average intelligence quotient of these foster children is practically identical with that of children in general. (88, p. 628.)

He found, also, that in the superior adoptive homes, as compared to the inferior adoptive homes, the intelligence quotients of the foster children were significantly higher. These conclusions have been contested, chiefly on the statistical side. It has been pointed out, for example, that although Freeman tried to control the effect of selective placement (the more intelligent foster child being placed in the better adoptive home), he was unsuccessful. The ultimate effect of this selection upon his results is unknown (32).

An important work, initiated by Freeman, in the study of the relative influences of heredity and environment in causing differences in twins, is the book, *Twins: A Study of Heredity and Environment* (1937), by Newman, Freeman, and Holzinger. A widely quoted conclusion of this study was the finding that

wide differences in the environment of identical twins were accompanied by similar differences in intellectual functioning (172, p. 349). Of interest here is Woodworth's observation, in reporting this investigation, that of the three investigators, Freeman placed somewhat more emphasis upon environmental inequality as producing differences in intelligence (288, p. 26).

In considering the implications of his studies for education, Freeman claimed that the function of education was to raise intelligence (89). He defined intelligence as "primarily . . . the ability to think" and as a type of "performance." (89, p. 19.) Consequently, according to him, intelligence was subject to the same influence that affects performance in general (89, p. 19). To Freeman, the old conception of intelligence which regarded "intelligence as being a fixed characteristic of the individual, unaffected by the conditions which surround him or by his experiences and activities" was a "bar" to the acceptance of evidence demonstrating the sensitivity of intelligence to the environment (89, pp. 16 f.).

On the political side, Freeman has not expressed himself widely. However, limited as such expressions have been they indicate a trend in his thinking. In a methodological discussion on the requirements of a study to enable valid racial comparisons in intelligence, he concluded:

> It is a question, therefore, whether the problem can ever be solved except by such a radical change in social and economic condition of Negroes in America as shall provide comparable environmental opportunities. It might be possible by a sufficiently extensive investigation to make a comparable sampling of the races, and perhaps the Army tests approach such a sampling. It hardly seems possible, however, to secure data which will be unaffected by difference in environmental influence without a more widespread and radical control of social and economic conditions than a mere scientific experiment can provide. (90, p. 522.) [1]

[1] Freeman's approach should be contrasted to that of Pintner, who in considering exactly the same problem, concluded, "Further advance in this field would seem to me to depend upon a better sampling of the two racial groups and upon a careful selection of the instruments for measuring intelligence." (199, p. 518.)

Thus Freeman places the burden for a suitable scientific experiment on changes in social and economic conditions. In an address on "heredity and environment" in which he considers their implications for "democratic" and "aristocratic" philosophies, Freeman maintained that "democracy" was not the "idle dream which some extreme hereditarians have made it out to be." (91, p. 19.)

In brief, Freeman can be classified as an environmentalist. With regard to his outlook on social and political questions, he inclines to the acceptance of a liberal position.

GEORGE D. STODDARD *1899–*

IN PSYCHOLOGY, Stoddard's name is most closely identified with the testing movement in its practical aspects. He was the director of the Iowa Child Welfare Research Station from 1928 to 1942. Since 1942, Stoddard has been chiefly interested in educational administration. He was President of the University of the State of New York and Commissioner of Education from 1942 to 1946. In 1946, he was elected President of the University of Illinois.

Stoddard's prevailing attitude has been one of emphasizing environmental factors in matters of controversy. As director of the Iowa Child Welfare Research Station he was responsible for its research program that led to the announcement of pronounced changes in the intelligence quotients of children placed in superior environments. These results attracted wide attention. The Iowa group contributed to the popularization of its results through magazines, newspapers, and radio. The 1940 Yearbook of the National Society for the Study of Education was chiefly concerned with the verification and discussion of these results.

Briefly, according to the Iowa results, which Stoddard defended, large changes in I.Q. were obtained by placing children of inferior parentage, at a very early age, in homes much superior to those offered by their true parents. Such children developed better than average intelligence. A spectacular result of the investigation was that offspring of feeble-minded parents developed into practically normal children. This result was in direct contradiction to previous results and notions, according to which the offspring of feeble-minded parents could only attain subnormal levels of intelligence. Another spectacular re-

sult concerned the magnitude of changes in the I.Q. It was asserted that a child of average endowment, if placed in a superior home at a sufficiently early age, could develop into a genius (genius as defined by psychologists) and conversely (215). Another aspect of the Iowa investigations dealt with children who attended preschool nurseries conducted by the Welfare Station. The results demonstrated gains in I.Q. which tended to be proportional to length of attendance (218, Chap. 14). On the basis of their results, Stoddard and his colleagues have proposed a theory of intelligence, the so-called "Iowa-Binet theory of intelligence," which "permits a large amount of change in a child's brightness through environmental impingements on the organism." (216, p. 436.)

The Iowa results have been severely criticized on both statistical and methodological grounds (161). The fact that the validity of the results was so questioned means that they cannot be accepted as conclusive, yet these results are sufficiently interesting to warrant further investigations. Especially significant is the fact that equivalent results have not as yet been generally obtained elsewhere in the country, despite the fact that many investigations have been directed to this end. Stoddard, in recognizing this fact, claimed that the other investigations were not comparable to the Iowa investigations in many important ways (216). The Iowa results, however, have been before the scientific world for ten years and no general verification has as yet been forthcoming from other institutions.

In addition to defending the Iowa results, Stoddard inclines to the position that existing evils are the result of malarrangements of society. For example, to him, juvenile delinquency is an "unmistakable symptom of social maladjustment, and can be removed only by the elimination of the causes of such maladjustment." (218, p. 443.) In contrast to the views of the eugenists, Stoddard maintained that "The great social problem of the world today is not shortage of talent, but wastage of talent." (216, p. 7.) Perhaps he had this idea in mind when he

proposed in 1936 that nursery education be provided to all children. In order to produce the necessary wealth for the fulfillment of this aim, he proposed, after noting waste and inefficiency of the economic system, various measures to secure the services of "idle men and idle machines." (214.) He was a strong advocate of extension of the franchise to the eighteen-year level (218, p. 475). In elaborating an implication of the Iowa results, he wrote:

> It can be predicted with some confidence that when homes give the child what he truly needs, at all ages from the first year upward, there will be a radical revision in the norms and standards for mental tests. But this is a minor consideration. More important to the welfare of children, and of the nation as a whole, is the idea that we must develop the unused reservoirs of mental power. The process will take courage. An abler and better informed youth population will demand changes in home, school, and community practice that transcend our traditional concepts of the young in society. Eventually such a program, if developed into a movement with social, economic and political implication, will lead to a way of life so truly democratic and American in its ideology as to frighten all but the firm believers. (218, p. 392.)

Evidently, Stoddard is on the side of social reconstruction. That human nature offered no barriers to such a program, from Stoddard's point of view, is evident in his reference to the possibilities of education: "There are forces available to scientists, physicians, and educators, to political, social and religious workers, which if used widely, as they already have been used in isolated circumstances, would bring peace and plenty upon this earth." (218, p. 441.) Placing his faith in responsible "human intelligence," he wrote:

> There is ample evidence . . . that the full understanding of man as a social being need not wait upon remote and dramatic biological events. The raw materials of life are good; they are plastic and tremendously varied. The problem of the times is to work steadily toward their preservation and enrichment. (218, p. 481.)

In brief, Stoddard can be classified as an environmentalist and a liberal on social and political questions.

LANCELOT HOGBEN *1895–*

HOGBEN, THE WELL-KNOWN British geneticist, has had a truly diversified career. A writer of best sellers on science and mathematics for the "citizen," he has written a volume of poetry and invented an artificial language. Furthermore, he expressed himself widely on political and philosophical questions. His main contributions to the nature-nurture controversy consist of two books: *Nature and Nurture* (1933) and *Genetic Principles in Medicine and Social Science* (1932). He is responsible for a redefinition of nature-nurture issues and is noted for his sharp and consistent criticism of eugenics (11).

His position on nature-nurture questions is typically expressed in the assertion that "no statement about a genetic difference has any scientific meaning unless it includes or implies a specification of the environment in which it manifests itself in a particular manner." (123, p. 14.) Gene differences may be increased or diminished according to variations in the type of environment. It is essentially this outlook that determines Hogben's criticisms of attempts to weight numerically the relative importance of heredity and environment.

A principal target of his comments was R. A. Fisher's analysis, the so-called "balance sheet of nature and nurture" that led to the conclusion that 95 per cent of the total variance in stature is due to genetic factors and not more than 5 per cent of the total variance is "due to causes not heritable." The usual interpretation placed upon this conclusion is that nurture is a negligible factor in determining differences in stature. On the basis of breeding experiments in the laboratory, and of theoretical examples in so far as human populations were concerned,

Hogben demonstrated that appropriate alterations in the environment lead to varying numerical weights which can be assigned to genetic and nurture factors. Therefore, the numerical comparisons of nature and nurture lose their significance in so far as control of the environment is concerned. As Hogben expressed it, "In so far as a balance sheet of nature and nurture has any intelligible significance, it does not entitle us to set limits to changes which might be brought about by regulating the environment." (123, pp. 111 ff.) And, Hogben's emphasis has been on demonstrating the possibilities of environmental control.

From his point of view, in considering the shortcomings of attempts to attach decisive importance to genetic factors in the interpretation of intelligence test results and in the interpretation of mental disease, Hogben has emphasized the possible effects of prenatal environment, nutritional factors, and the social environment (123, p. 28 *et passim*). For instance, he asserted that, in order to assess properly the significance of genetic factors, it was necessary first to equalize the environment (121, p. 120). In addition, of course, he has indicated the statistical, genetic, and logical factors that are involved in such discussions. He has not overlooked the role of genetic factors in the interpretation of various results. Thus, in his discussions of insanity, amentia, deaf-mutism, and other characteristics, the influence of genetic components is given due weight (121, pp. 110 ff.). In what might appear to be an extreme statement, he termed diabetes insipidus a "hereditary disease" since it satisfied the "quantitative requirements of Mendelian hypothesis." (121, p. 43.) From his point of view, however, it does not thereby follow that diabetes insipidus is not subject to successful external control. In a discussion of the incidence of smallpox in present-day England as compared to England of two hundred years ago, Hogben considers the practical disappearance of smallpox today as a result of "historic environment," at the same time allowing that an individual may succumb to

smallpox, as compared to another individual equally exposed, for reasons of susceptibility (123, p. 30). Evidently, nature and nurture are "interdependent factors," a view which is descriptive of his general attitude.

Hogben has further indicated an environmentalist outlook by his belief in racial equality and, in contradistinction to eugenists, by minimizing the causal role of natural selection in social development (cf. 122, p. 209).

Hogben was an early adherent to socialistic principles. Writing in the *Socialist Review* (1919) on "Modern Heredity and Social Science," he held, in contrast to the social Darwinists, that "between biological science and economic determinism there is no conflict." (120, p. 153.) It is essentially this same attitude which determined his criticisms of eugenics, which he once defined as "an influential current of contemporary superstition." (126, p. 45.) Some criticism of eugenic doctrine finds its way into practically all of his books. To his way of thinking, "eugenics became identified with a system of ingenious excuses for combating the amelioration of working-class conditions." (124, p. 1041.) In his *Dangerous Thoughts*, a political tract, he devotes a chapter to a discussion of the social bias of eugenists, among whom are included Leonard Darwin, R. A. Fisher and Charles B. Davenport (126, Chap. 3). Speaking as a geneticist, he held that environment should be equalized in order to determine the genetic nature of differences. Therefore, he thought it "curious" that "eugenists who profess to be interested in promoting knowledge about human inheritance bitterly oppose social reforms directed to equalise the environment." (123, p. 30 n.) In contrasting eugenic to social reform, he wrote:

> To the writer it seems that the selfishness, apathy and prejudice which prevent intellectually gifted people from understanding the character of the present crisis in civilisation is a far greater menace to the survival of culture than the prevalence of mental defect in the technical sense of the term. (123, p. 33.)

In opposition to a common view of eugenists, he believed that "the most formidable problems of civilisation do not arise from limitations in the ability of men and women to command the resources of nature." (123, p. 9.) Hogben's strictures on eugenics provoked several critical editorials in the *Eugenics Review*, the official organ of the Eugenics Society (173).

Pleading for a science of "preventive social medicine," he asserted that a pressing problem was the estimation of the "remediable wastage due to defective social organization and the loss of social efficiency resulting therefrom." (125, p. 44.) Thus, his associates, under his influence, studied the question of "ability and opportunity" in English education. For example, they pointed out that, of all individuals capable of assimilating a university education, only one quarter had the opportunity to do so (125, p. 368). In terms of Hogben's outlook, this fact constitutes "remediable social wastage," quite apart from the question of the relative influences of nature and nurture. With possibly a similar point of view in mind he wrote, "poverty . . . is not materially inevitable. The only obstacle to removing it is lack of social initiative." (126, p. 16.) War, he thought, was another remediable social defect. He deplored the eugenists' contention that expenditures for treatment of mental disease were a "waste of money," while they ignored the large expenditures for war (126, p. 56). His views on wastage are related to his "socialist creed," that "no system in which credit and industry are privately owned can take the fullest advantage of new scientific knowledge for the satisfaction of common needs." (126, p. 13.)

In brief, Hogben may be classified as an environmentalist, though certainly not an extremist, and a believer in radical social and economic doctrine.

J. B. S. HALDANE *1892–*

HALDANE, THE EMINENT British geneticist, is well known as a popularizer of science. His views on nature-nurture issues have been influenced by the dominant eugenics trend in England. Consequently, his views are stated chiefly with regard to such issues as sterilization (eugenic), the hereditary basis of mental defect, differential fertility, and political implications of biology. He was not concerned with the findings of psychology in considering nature-nurture issues and usually limited his discussions to the results of experimental genetics.

Keeping in mind the special background of Haldane's discussions, he may be classified as an environmentalist. Eugenic sterilization, with its particular emphasis on hereditary determination of physical and mental qualities, found in Haldane a consistent opponent. He criticized the application of the idea of eugenic sterilization on the basis that the genetical data assumed by its advocates were inadequate to justify the legislative programs which were enacted in the United States and Germany as well as those proposed in England (113, Chap. 1). For instance, he objected to the suggestion of MacBride, the British geneticist, that the unemployed should be sterilized (111, p. 243). In considering the question of the causation of mental defect, Haldane rejected the statistics which were quoted to show that a high percentage of defective children originated in defective ancestry. For instance, in contradicting an assertion of R. B. Cattell that 75 per cent of the children of the feeble-minded are also feeble-minded, Haldane cited evidence that would indicate the figure to be 7.2 per cent (112, p. 333). In 1938, he inclined to the view that the increase in the certified

feeble-minded was a social problem. Interpreting evidence presented by L. S. Penrose to the effect that defectives are employable in simple tasks, Haldane wrote:

> If this statement is true, it suggests that mental defect is to a large extent a social rather than a biological problem. In a society where there was work for all, and vocational selection, places would be found for many, perhaps the majority of people who are now regarded as feeble-minded. The large increase in recent years of the number of people certified as feeble-minded may turn out to be a result of the increasing difficulty in finding regular employment rather than of any rise in the number of people falling below a certain grade of intelligence. In fact it may be a social and economic rather than a biological problem. (113, p. 108.)

With reference to the allied question of differential fertility, Haldane acknowledged its possible eugenic implications. He suggested that the problems connected with the question of differential fertility could be solved by raising the economic standards of the poor. In this manner the birth rates of various classes would tend to equalize (111, p. 108).

In considering the question frequently raised in nature-nurture discussions, "What is the relative importance of nature and nurture?" Haldane held that no general answer could be given (113, pp. 34 f.). In particular populations and in particular environments either heredity or environment might be of predominant importance. He avoided giving any numerical estimate of their relative importance. It should be mentioned that in his discussions of the issue Haldane has not strictly confined himself to comparing nature and nurture within the ordinary range of social and economic environment, as is usually done, and that consequently his discussion is somewhat theoretical (113, pp. 34 f.).

In his analysis of the question of whether there are differences in intelligence between the social classes, Haldane accepted Lawrence's work on illegitimate children, which seemed to demonstrate the existence of such differences (113, p. 125). He minimized, however, the importance of these differences

by pointing out that they were largely due to the extremes, namely, "the professional classes and unskilled and casual labourers." (113, p. 126.) Furthermore, he conceived of the possibility that these differences might result from biased intelligence tests which are constructed by members of professional classes (113, p. 126). Nevertheless, he acknowledged a "slow decline" in the mean intelligence quotient of the population of Great Britain if "the existing differences in fertility of social classes" continued (113, p. 126). This admission of the validity of a eugenic argument was immediately countered, however, with the contention that the more fertile classes might be endowed with desirable qualities (lack of "undue aggressiveness," for example) to a greater extent than the more successful social classes (113, pp. 126 f.). Furthermore, holding that the "whole question is enormously complicated," he wrote, "If animal genetics affords any analogy, future work is likely to reveal entirely unsuspected facts concerning the determination of human intellectual capacity." (113, p. 128.) Thus, to Haldane, the question of declining intelligence has not as yet been resolved.

With the underlying idea in mind that "biological arguments have no political value," Haldane has been a consistent critic of eugenics doctrine. He exposed, from his point of view, the illogical nature of the political implications commonly drawn from eugenic ideas. His method was to call attention to alternative implications which were overlooked by eugenists. In 1933 he wrote:

> There is one attempted application of biology to politics, that is the eugenics movement. If you take the Eugenics Society as typical of that movement, the conclusion to which most of their spokesmen have been led is that the poor, on the whole, carry an undesirable heredity and that they are breeding too fast. Generally, therefore, members of that society believe in measures which would tend to slow down the breeding of various sections of the poor, and many of them would like to subsidize breeding among the rich, who, it is believed, contain superior stocks. (111, pp. 130 f.)

Though Haldane accepted these views he did not regard them as "scientifically proven." Contrary to the conservative implications educed by Dean Inge and Major Darwin, Haldane maintained that socialism was the next logical step (111, 130 f.).

Haldane has been an avowed follower of Marxian theory since 1934 and one of its vigorous popularizers (114). In 1937, in a personal statement as to what he expected of life, he wrote:

> I am a socialist because I want to see my fellow men and women enjoying the advantages which I enjoy myself. I know that socialism will not confer all these advantages in an instant, but if I live to see capitalism overthrown and the workers in power through most of Europe I shall die happy. (115, p. 280.)

In summary, Haldane may be classified as both an environmentalist and a political radical.

JOHN B. WATSON *1878–*

WATSON'S DOMINANT INTEREST was in animal psychology. He wished to extend the methodology of animal psychology in a thoroughgoing way to the whole of psychology. He named this extension behaviorism. Although he had set forth his views on behaviorism in 1912, it was not until after the war that they gained wide attention, not only among scientists, but among the public at large as well. Watson himself was largely responsible for the popularization of behaviorism through lectures, magazine articles, and debates. Furthermore, he extended behaviorist concepts to problems of general interest such as personality formation and training of infants. To some receptive scientists, behaviorism, in its methodology, was identified with natural science (cf. 168). To others, its emphasis on environment must have represented an alternative to the general emphasis placed upon heredity by psychologists following the first World War, particularly in their treatment of social problems.

Watson presented behaviorism as an environmentalistic doctrine. He rejected eugenics; and, contrary to the typical thinking of the period, he held that "there is no such thing as an inheritance of *capacity, talent, temperament, mental constitution and characteristics.* These things again depend on training that goes on mainly in the cradle." (277, p. 94.) Emphasizing the "limitless plasticity" of the infant he maintained that "men are built, not born." (272, p. 233.) His optimistic view of the potentiality of human beings is brought out in his widely quoted statement:

Give me a dozen healthy infants, well-formed, and my own specified world to bring them up in, and I'll guarantee to take any one

at random and train him to become any type of specialist I might select—doctor, lawyer, artist, merchant-chief and yes, even beggar-man and thief, regardless of his talents, penchants, tendencies, abilities, vocations, race of his ancestors. (277, p. 104.)

His view was even more extreme when he wrote:

If you start with a healthy body, the right number of fingers and toes, eyes, and the few elementary movements that are present at birth, you do not need anything else in the way of raw material to make a man, be that man a genius, a cultured gentleman, a rowdy or a thug. (273, p. 41.)

Consistent with this foregoing view is the one that all "mental diseases" are the results of conditioning (277, p. 297).

The agency through which man could be transformed was conditioning. Heredity was no barrier to the type of individual that conditioning and habit formation could achieve. Watson attempted to avoid explanations in terms of heredity. His own explanations, however, usually were not quite consistent with his extreme environmentalism. In his 1919 volume, *Psychology from the Standpoint of the Behaviorist*, he acknowledged the influence of heredity upon individual differences and emotional responses (271, Chap. 6). It was in the subsequent volumes that Watson's environmentalist position became extreme. But in denying the effects of heredity, he indirectly admitted their relevance in his discussion of genetics (277, pp. 50 ff.), a discussion which is based upon Herbert S. Jennings' *The Biological Basis of Human Nature* (1930). Jennings by no means denied the effects of heredity upon individual development. Watson's tacit acceptance of the influence of heredity was evident in the very choice of his examples to prove the all-importance of environment. For example, in discussing the evidence based on identical twins reared apart (thus assuming at the outset that such twins are identical in their heredity) he attempted to emphasize the differential influence of environment (277, p. 109). Watson was evidently assuming that to admit the influence of heredity was to deny the influence of environment. At several

points he accepted the reality of inborn mental defect (274). The recognition of possible genetic differences between genius and normality is also consistent with this view. It should be noted that Watson, as he himself pointed out, offered no evidence that a normal individual could be transformed into a genius. Thus, Watson was somewhat confused in his theoretical thinking on the interrelation of nature and nurture.

It is to be noted that Watson, in considering behaviorism as a branch of biology, was led to emphasize environment contrary to the usual view that the biological point of view leads to emphasis on heredity.

The optimism manifest in Watson's psychological position would lead one to expect that he would express a similar optimism with regard to the reconstruction of society, an expectation not justified, however, in Watson's writings. The radical possibilities inherent in Watson's point of view are brought out by McDougall's observation, in explaining the popularity of behaviorism, that it appealed to "bolshevists." (276.) The application of behaviorism to society, according to Watson, would bring about a "rich and wonderful individual." In eschewing "revolution," he wrote:

> I am trying to dangle a stimulus in front of you, a verbal stimulus which, if acted upon, will gradually change this universe. For the universe will change if you bring up your children, not in the freedom of the libertine, but in behavioristic freedom—a freedom which we cannot even picture in words, so little do we know of it. Will not these children in turn, with their better ways of living and thinking, replace us in society and in turn bring up their children in a still more scientific way, until the world finally becomes a place fit for human habitation? (277, p. 303.)

In an article entitled, "Utopia," he indicated some reforms which would bring about the desired type of society. He would exclude churches or priests, put to death the feeble-minded and idiots, and disallow hereditary wealth (274). He omitted reference, however, to the contemporary political and social or-

ganization of society. His acceptance of the idea of social experimentation in order to determine the correctness of various institutions may be construed as consistent with liberal principles. On the other hand, Watson has expressed views which may be consistent with a conservative outlook on things.

In 1930, with the idea of unplanned social experimentation in mind, Watson wrote that America was "ruled" by "professional politicians, labor propagandists and religious persecutors." (277, p. 44.) Watson applied behavioristic principles to an analysis of the limitations of "free speech." Watson's identification of thought with bodily movements should be kept in mind at this point. He wrote, in a discussion on the possibilities of an ideal society and on his opposition to "free love":

> I am not arguing here for free anything—least of all free speech. I have always been very much amused by the advocates of free speech. In this harum-scarum world of ours, brought up as we are, the only person who ought to be allowed free speech is the parrot, because the parrot's words are not tied up with his bodily acts and do not stand as substitutes for his bodily acts. All true speech does stand substitutive for bodily acts, hence organized society has just as little right to allow free speech as it has to allow free action, which nobody advocates. When the agitator raises the roof because he hasn't free speech, he does it because he knows that he will be restrained if he attempts free action. He wants by his free speech to get someone else to do free acting—to do something he himself is afraid to do. (277, p. 303.)

It can hardly be maintained that Watson presented a convincing argument against "free speech," in terms of his own psychological system. Logically, Watson should have been opposed to free thought since thinking, according to him, is a form of talking. In 1929, when he urged drastic reform of divorce laws in order to simplify divorce procedures, his suggestions were avowedly along class lines—only those with incomes of over several hundred dollars per week would be able to benefit by his proposed changes (275). Such a proposal is not consistent with a liberal outlook on the problems of society.

In brief, Watson may be classified as an extreme environmentalist. With regard to socioeconomic views, his position is ambiguous and somewhat inclined in a conservative direction. Watson thus presents a contradiction to the expectation that a liberal socioeconomic standpoint is associated with the environmentalist position.

Part Three

SUMMARY AND CONCLUSIONS

IN THIS STUDY, the writings of twenty-four scientists active in the field of nature-nurture discussion were examined to ascertain whether there was any significant relationship between their emphasis on nature or nurture and their particular sociopolitical orientation. These scientists were drawn from England and America in the years 1900 to 1940. Of these, twelve are environmentalists. They are: William C. Bagley, Franz Boas, James McKeen Cattell, Charles Horton Cooley, Frank N. Freeman, J. B. S. Haldane, Lancelot Hogben, Herbert S. Jennings, Hermann J. Muller, George D. Stoddard, Lester F. Ward, and John B. Watson. Of the twelve, all were classified as either liberals or radicals with the exception of Watson, who was classified as conservative.[1] The other twelve scientists were classified as hereditarians. They are: William Bateson, Charles B. Davenport, Edward M. East, Francis Galton, Henry H. Goddard, Leta S. Hollingworth, William McDougall, Karl Pearson, Paul Popenoe, Lewis Madison Terman, Edward Lee Thorndike, and Frederick A. Woods.[2] Of the twelve, all were classified as conservative with the exception of Terman, who was classified as liberal.

With regard to the initial problem of this study, it can be stated that in fact, and within the scope of the material herein presented, varying nature-nurture emphases were significantly related to particular sociopolitical orientations; those emphasizing environmental factors tended toward liberalism or radicalism, those emphasizing hereditary factors tended toward con-

[1] The meanings to be attached to these terms rest upon their usage in this study.

[2] The median birth dates of both groups are approximately equal—1871 is the median birth date for the hereditarians and 1875 is the median birth date for the environmentalists.

servatism.[3] There were two contradictions to this generalization, namely, Lewis Madison Terman and John B. Watson. It is, of course, entirely possible that with the analyses of more individuals, further contradictions to the thesis will be uncovered. It should be mentioned that a special search was conducted for such contradictions. Within the area of this search, however, no other exceptions were found. But their existence is not denied.

The interpretation of causal relationships between nature-nurture outlook and political outlook will be reserved for the next section since, in addition to the difficulties usually inherent in a causal analysis, the existence of contradictions makes an attempt at such an analysis insecure and tentative.

A basic finding of this study is that the two variables are interrelated in the thought patterns of the various scientists. Nature-nurture discussion evolved in a social matrix both in the formulation of problems and in the stated implications of conclusions for society at large. Most of the individuals discussed here show a marked degree of awareness of the social orientation of their scientific thinking, and they show a similar degree of awareness of the scientific implications of social and political goals. This inner relationship suggests that it would be as reasonable to classify the nature-nurture controversy as sociological in nature as it is to classify it as scientific in nature. Certainly, the controversy can be interpreted as being both sociological and scientific. It should be mentioned that the relationship between the two variables is historically conditioned. Under different historical conditions, or with the development of science, the relationship found to exist for one period need not obtain for any subsequent period. It should be noted that the men of science considered here were constantly aware of the prob-

[3] Within each group, however, hereditarian or environmentalist, there probably does not exist a one-to-one relation between degree of emphasis on nature or nurture and political orientation. For example, Haldane, who accepts a social and political viewpoint far more extreme than that which Jennings accepted, is less of an environmentalist.

lems that confronted an evolving society and that their work partly represented efforts at providing suitable answers to these problems. If errors were made, errors facilitated by the nature of the subject matter, they would be the errors that any public-spirited citizen might make. And in this situation, there is nothing reprehensible.

Possible Interpretations of Causal Relationships

Galtonian hypothesis.—In describing the influence of *Darwin's Origin of Species* upon his thinking, Galton wrote:

> I devoured its contents and assimilated them as fast as they were devoured, a fact which perhaps may be ascribed to an hereditary bent of mind that both its illustrious author and myself have inherited from our common grandfather, Dr. Erasmus Darwin. (100, p. 289.)

This quotation suggests the interpretation that emphasis on environmental or hereditary factors represents the varying outcomes of innate predispositions—the concomitant sociopolitical attitudes would, therefore, be derivative from these predispositions. This interpretation of the relationship is rejected in this study if only on the ground that modern psychological thinking regards attitudes as learned products.

Subject-matter bias.—Woodworth's preliminary comments in his monograph, *Heredity and Environment,* suggest an interpretation which attaches significance to the relationship in so far as it reflects the particular subject matter in which the scientist operates.

> Biologists, because of the very impressive advances in the science of genetics, are quite justifiably inclined to stress the importance of heredity in the human field. Sociologists and educators, dealing with environmental factors, are properly inclined to emphasize the importance of environment. Psychologists are more divided in their interests and it is perhaps in the field of this science that the contro-

versy between hereditarians and environmentalists is most acute. (288, pp. 1 f.)

In terms of the data of this study, it is difficult to assess the value of this interpretation. The effect of subject matter, however, surely is a real factor, if only on logical grounds. For example, the sociologist must assign a significant role to environmental forces, otherwise he would be denying the validity of his subject matter; and the educator must do so also. That this interpretation is incomplete, however, is borne out by the fact that the geneticists and psychologists in this study exhibit the same range of attitudes, although the "statistical means" might be different.

Nature-nurture outlook the determinant of sociopolitical outlook.—R. B. Cattell's remark that "hereditarians" are "scientists" whereas the "environmentalists" are "propagandists" essentially implies that nature-nurture position conditions sociopolitical outlook (53, p. 36). This interpretation might conceivably go a long way toward explaining the relevant facts. A drawback to this interpretation lies in the fact that competent observers infer different scientific and social implications from the same body of nature-nurture data. In order to explain these various scientific and social implications, it would be necessary to postulate the existence of another attitude which involves neither nature-nurture outlook nor sociopolitical attitudes. But then the crucial question arises as to the nature of this attitude.

Sociopolitical outlook the determinant of scientific position.—In his introduction to the publication of the papers delivered to the First International Eugenics Congress (1912), Major Leonard Darwin wrote:

Ultimately it may be possible to induce Society to adopt a well-considered eugenic policy and to carry out reforms on eugenic lines. To attain these ends, however, it is necessary that those who are alive

to the dangers of the present social situation should combine together for the purpose of exchanging views, and of discussing concerted schemes of action. (64.)

This quotation suggests that nature-nurture issues, the discussion of which was the dominant theme of the eugenics movement, were conceived in relation to the critical problems confronting society. This fact is also indicated in H. M. Parshley's remark (1925) that "it is necessary in the heat of battle with the reformers to insist on the Galtonian antithesis of nature vs. nurture." (176, p. 138.) However, Parshley further suggests that a definite attitude toward nature-nurture issues is required by the nature of the social situation.

The interpretation that sociopolitical outlook determines scientific position depends upon the rationale presented in the introduction of this study, namely, that the nature-nurture controversy in science corresponds to a cleavage among individuals sensitive to social and political issues. From this point of view, then, the coincidence of the nature-nurture controversy with the rise of attempts at social and political reconstruction of society and the interrelatedness of nature-nurture discussion with political issues among the scientists studied in this study are not accidental. A drawback to this interpretation lies in the paucity of material suggesting the relevant temporal sequence for causational analysis.

The independence of sociopolitical outlook and scientific position.—It may be that since this study was confined to the written expressions of individuals, a selective error is thereby introduced. Many individuals with a definite point of view with regard to nature-nurture questions did not express themselves on sociopolitical issues. Conceivably this may be due to the fact that such individuals sensed a contradiction between their scientific and political outlooks, and consequently refrained from expressing themselves politically. Thus, the connection between

nature-nurture and political orientations could be considered as accidental. The necessary information with regard to such individuals is not available. However, in this study, the fact that some individuals (Frederick A. Woods, for example) were aware of the interaction between nature-nurture and sociopolitical orientations indicates a nonaccidental relationship. Its generality, of course, is another question.

Conclusion

In the selection and interpretation of the data presented in this study, the point of view of the writer was kept in the background in the attempt to maintain objectivity. Since, however, in spite of this precaution, the writer's own outlook may have interfered with strict objectivity, it is best to have some statement concerning his own evaluation of the data.

In the opinion of the writer, the sociopolitical allegiances of the scientists were a significant determinant of their position on nature-nurture questions. It is his opinion that these allegiances had a marked effect upon the formulation of a hypothesis and the method of its verification, the conclusions drawn from an investigation, and the statement of implications of these conclusions for society. Different scientists were differently affected by their political allegiances. (For a given investigator, the effect of political allegiances upon his thinking depended much upon the nature of the problem under consideration.) [4] The nature-nurture controversy, qua controversy, has been sustained by the conflicting social philosophies of the scientists. It seems that in a few cases the scientists concerned were able to hold their allegiances to one side and were able to discuss problems in terms of their intrinsic scientific merits. It is probable, how-

[4] With regard to some individuals, it is quite likely that the formulation of their social philosophy was markedly influenced by virtue of an earlier adherence or exposure to a particular scientific tradition. If such was the case, the opinion of the writer is that the resulting social philosophy, in turn, interacted with the initial scientific slant and sustained it.

ever, that in most cases the scientists were not aware of the specific impact of their political loyalties upon their scientific thinking.[5]

[5] In this respect, it should be mentioned that the sharpest reactions, in those cases where a given scientist had the opportunity to evaluate the section of this study dealing with his own views, came from the hereditarian wing. May not this differential effect be due to the fact that the hereditarians were not as ready to accept the connection between their political affiliation and scientific outlook as were the environmentalists?

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INDEX

THE NATURE-NURTURE CONTROVERSY