were born from two to five hours short of a full sixteen days from the time of copulation.

Twenty-eight days is probably the youngest recorded age of attainment of sexual maturity in a mammal, as well as in the vertebrates generally.

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CONCERNING THE TERM "RACE DIFFERENCES" AND THE CONCEPT "CULTURE"

WOULD it not serve to clarify the current controversy between Professors Garrett and Herskovits and their respective adherents if those concerned could agree first of all on the meaning of the term "race differences"? Professor Garrett has twice emphasized the fact that "studies in this country over the past forty years have regularly and consistently found differences as between the American Negro and the American White."[1] On the basis of this fact Professor Garrett seems to argue that there are race differences (of a psychological nature), even while admitting that the differences in question are subject to a number of interpretations. Now the very fact that these differences *are* subject to more than one interpretation is what makes most anthropologists unwilling to call them "race differences." Until it can be proved that they are subject to only *one* interpretation—namely, that they are the result of genetically determined biological differences between the two groups compared—it is not justifiable, from the anthropological point of view as regards terminology, to speak of them as race differences.

As for the concept of "culture," anthropologists can hardly have reacted with anything but amazement to Professor Garrett's side challenge to Professor Herskovits for a clarification of this "nebulous concept." There may be some differences of opinion among anthropologists, and particularly among archeologists, as to what constitutes "*a* culture," but certainly there is none as to what constitutes "culture" in general. Lowie's definition is explicit enough:

> By culture we understand the sum total of what an individual acquires from his society—those beliefs, customs, artistic norms, food-habits, and crafts which come to him not by his own creative activity but as a legacy from the past, conveyed by formal or informal education.[2]

So far as I am aware, no question as to the meaning of this concept has arisen in the anthropological literature of the past decade, nor has it come up in seminars or professional meetings.

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SCIENTIFIC BOOKS

MAINSPRINGS OF CIVILIZATION

Mainsprings of Civilization. By ELLSWORTH HUNTINGTON. xii + 660 pp. New York: John Wiley and Sons, Inc. 1945. $4.75.

As always, in reading a book by Dr. Huntington, the reviewer finds himself torn between admiration for the ingenuity displayed in devising hypotheses to explain vast areas of human conduct and in ferreting out facts which seem to the author to support these hypotheses, and irritation that this ingenuity is not used in testing smaller but more specific hypotheses which are beyond the border of the known but within the realm of the possible in the present state of our knowledge of man's life on the earth.

The "three main principles set forth in this book" (p. 607) are: (a) "that civilization is the unfinished and perhaps never-to-be-finished, product of some great evolutionary force which permeates all nature"; (b) "the action of this force is swayed by three great factors, namely, biological inheritance, physical environment and cultural endowment"; (c) "these three constantly react upon one another, and a knowledge of their combined influence is a prerequisite to a full understanding of history." The reviewer would not hesitate to accept these hypotheses, indeed he can not see how one can do other unless (a) is a reference to some transcendent mystical force which shapes man's destiny willy-nilly, but he feels that what we need in social science is to pin ourselves down to a more specific measurement of the role of each factor in a definite human situation.

There can not be much doubt that in the long course of human development the physical conditions of life have had a selective influence on man's physical and mental make-up. But one finds great difficulty in believing that the qualities Dr. Huntington attributes to Puritans, Parsees, Jews, Armenians, Chinese, Junkers and other "kiths" are biological (hereditary) to the degree he holds. It is true that he makes much of the adaptability of the human race to environmental conditions, but at the same time he seems to believe that the adaptability of the individual within a given cultural group is relatively small, hence, that individual achievement as well as that of the groups

[1] SCIENCE, n.s., 101: 406.

[2] Robert H. Lowie, "The History of Ethnological Theory." New York: Farrar and Rinehart, Inc., 1937.

he has called "kiths" (Puritans, Jews, Chinese, etc.) is determined in a major degree by the heredity of the "kith" and by climate, temperature, ozone, electrical disturbances of the atmosphere and other aspects of physical environment.

The reviewer would be the last one to deny that climate, etc., make no difference in the culture of peoples, that a tropical environment will produce a civilization different from that of Iceland; nor would he question the effects of diet and disease on the energy of different peoples and on their cultural development; but he does not think that Dr. Huntington has proved that these differences in culture are primarily due to hereditary differences induced by physical environment as he seems to believe in spite of his care in calling attention to the constant operation of all three factors.

As a sociologist the reviewer feels that Dr. Huntington has at best but a dim appreciation of the way in which one's cultural environment permeates his every thought and action. This is because Dr. Huntington thinks of culture in terms of a culture of the Puritans or Armenians or Chinese or Junkers or some other "kith" and ignores the family, the neighborhood, the gang and other intimate groups as purveyors of culture to the individual and to smaller groups within the "kith." This failure to understand the relation of the individual to his intimate groups is also the basis of Dr. Huntington's underlying belief that social classes, as manifest in present-day societies, really rest on fundamental hereditary differences, that is to say, have a basis in the natural order and hence can not be disturbed without danger of social deterioration.

Since his search is for physical factors lying beyond man's control (heredity, climate, weather cycles, etc.) which determine his conduct it is not strange that he neglects to a large extent those which lie primarily within his control, his family and community life, his social organization, his economic system, his religious beliefs, etc., and hence falls back largely on physical determinism to explain human conduct.

In the judgment of the reviewer this is a useful book and should be widely read, even though the author sets himself the impossible task of analyzing "the role of biological inheritance and physical environment in influencing the course of history" (p. v) rather than studying their influence in particular situations which might be handled more scientifically.

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PHYSICAL GEOLOGY

Principles of Physical Geology. By ARTHUR HOLMES. xii + 532 pp. 95 pls. 262 text figs. New York: Ronald Press, 1945. $4.00.

THIS is an introductory volume designed for the general reader as well as for students and teachers of geology. The book should appeal to large numbers in each of these groups because it is unusually well written in a clear and forceful style. In organizing his material Dr. Holmes has departed from the pattern ordinarily followed in introductory texts. Recognizing that the various aspects of geology can not be understood or fully appreciated except in relation to the whole and recognizing too that many of his readers may have no prior acquaintance with the subject the author opens his text with a "Preliminary Survey." This part, the first of three, occupies slightly more than one fifth of the volume and is in itself a very readable introduction to geology. Part two is devoted to a more detailed consideration of external processes and their effects, part three to a similar treatment of internal processes and effects. Duplication in the later sections of the book of material given in the preliminary survey is largely avoided by careful writing and the arrangement should be successful in developing and maintaining the reader's interest.

The results of many recent researches, some published as late as 1943, are included. The author's attempts to discriminate between fact and theory are successful in most instances, and several of geology's unsolved problems are deliberately left in an unsettled state.

Innovations are not limited to the broad outline of the subject. There are rather detailed discussions of topics such as the causes of vulcanism, the transmission of earthquake waves and continental drift that usually receive perfunctory treatment in introductory texts. The prominence given to such discussions may explain, in part, the absence of certain types of information that ordinarily are included in beginning texts. Thus, though both coal and oil are given fairly comprehensive treatment, ore deposits are almost completely ignored. The relation of geology to astronomy is mentioned casually, but the customary discussion of earth relations and the origin of the earth are passed over.

The author has admittedly made a special effort to illustrate the text as fully and as effectively as possible. In preparing and assembling the text figures this goal has been achieved. About 200 of the 262 figures are sketches, diagrams and maps that add a great deal to the work, some of them bringing out broad relations in a very striking manner. There are