Gathy, Černosvitov and others, claims that there are the same number of chromosomes on the first and second maturation spindles as during segmentation and that, in this respect, there is no difference between normal and uniparental eggs. The interpretation of this remarkable situation is obscure and the facts themselves require fuller investigation. Against the occurrence of parthenogenesis, Gavrilov believes that he has found evidences of spermatozoa in the uniparental eggs.

Uniparental production of progeny is probably quite general among the Oligochaeta. Gavrilov quotes unpublished observations of Černosvitov on *Enchytraeus albidus* Henle and of Janda on *Eisenia foetida* (Sav.); in both these forms reproduction can occur in the absence of reciprocal copulation. On the other hand, isolated specimens of *Rhynchelmis limosella* Hoffm. showed reduction of the sexual organs and produced at most only a few uniparental eggs which failed to develop beyond the segmentation stages. According to Kobayashi[5] there are as many as ten species of the oriental genus *Pheretima* which frequently or even usually lack male pores. This author was able to demonstrate the production of viable young by individuals of the Japanese-Korean species, *P. hilgendorfi* (Michaelsen), which were without male pores and which had been isolated before reaching sexual maturity. As in the case of the species discussed previously, parthenogenesis is not excluded, but the presence of testes argues in favor of some form of self-fertilization.

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HAMSTER SEXUALLY MATURE AT TWENTY-EIGHT DAYS OF AGE

SHEEHAN and Bruner[1] have summarized our limited knowledge of the care, breeding habits and estrous cycle of the golden hamster (*Cricetus auratus*). Their published data on the development of the hamster pups and on the gain in weight through the sixth week of growth have been substantially corroborated by the writer.

Our records show that the newly born young averaged 1.9 grams instead of 2.23 and 2.49 grams for the females and the males as recorded by Sheehan and Bruner, and our young hamsters did not show a failure to gain weight during the fourth week as they reported.

The females will breed only during the early evening hours. During November copulation began about 7 P.M. (Pacific war time) and during March and April about 7:30. On December 5th a female refused to copulate at 5 P.M., again refused at 6 P.M., and at 7 P.M. copulated repeatedly with all four of the males in the cage. When not in heat the females usually attack the males and occasionally inflict wounds of varying degrees of severity.

The estrous cycle of the hamster recurs every four days. During the morning following an evening when the female was receptive for copulation, a white mass of vaginal fluid containing leucocytes and epithelial cells appears at the orifice of the vagina. Upon application of slight pressure with the finger it can be expressed readily. The evening of the third day following the appearance of the vaginal exudate the female will again be in heat. We found this to be a very simple and satisfactory way of keeping track of the cycles in the different females.

In addition to water, the hamsters were fed daily a standard laboratory pellet for dogs and liberal amounts of fresh bur clover (*Medicago hispida*) of which they were exceedingly fond. What special part, if any, the bur clover had in stimulating early breeding can not be stated by the writer; however, stockmen have long recognized bur clover as being a highly nutritious forage plant.

Hamsters are said to breed at eight to twelve weeks of age.[1] Upon several occasions the writer observed young females from 42 to 45 days of age copulating with mature males. Two of these females, one that copulated on the 42nd day, gave birth to eight young, and the other (45th) contained fourteen fetuses when she was killed on the fourteenth day of gestation.

In order to determine the minimum age at which the female hamster will breed, ten 21-day-old females from two litters were selected on April 25th. Each evening for an hour they were placed in a cage with seven sexually experienced males. They copulated at the following ages in days: 27, 28, 29, 29, 30, 31, 31, 38, 42. The tenth female never copulated during the experiment and was the only one of the ten that did not become pregnant during the two months that the experiment was in progress.

The female that copulated when she was 28 days old gave birth to five young when she was 44 days of age! She successfully raised and weaned all five of them. Another female, the one that copulated on her 31st day, had nine young when she was 47 days old and raised them all. The two next youngest females were 54 and 58 days of age when their litters of four and nine young were born. In these experiments the young were usually born on the sixteenth day of gestation; however, on several occasions young

[5] S. Kobayashi, *Sci. Rep. Tohoku Imp. Univ., Biol.*, 11: 473–485, 1937.

[1] John F. Sheehan and Joyce A. Bruner, *Turtox News*, 23: 65, 1945.

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.