

reversal within the egg has been accomplished. Further evidence for this is given in a number of tests, mostly dealing with egg-size and stored energy. As I have recently ("Ergebnisse der Biologie," II, 1927) discussed these things I do not want to repeat the details here. It is simply a fact that no genetical or embryological proofs of sex-reversal have been furnished in this case (both have been amply furnished in my work with moths), that all evidence is circumstantial and in addition based on assumptions of the nature of a *petitio principii*, as shown in my recent discussion. With all due respect for Riddle's physiological and biochemical work involved in the study of his case, I must state that he has never produced (or never published) experimental intersexuality and never proved experimental sex-reversal or made it even probable.

Has then Riddle's theory of sex determination by different metabolic rates within the eggs in spite of its poor foundation, helped in any way towards an understanding of sex-phenomena? I am unable to see such a success. The theory already fails in the normal case of male heterogamety; it fails in such cases of female heterogamety as the gipsy moth, where the same egg can be made to develop into a female, a male, a female intersex and a male intersex if fertilized with the proper sperm; it fails in such cases as *Drosophila* where a normal egg gives a male with a Y-sperm, but an XX egg a female with the same sperm. Of course, Riddle might say that in all these cases the metabolic rate has been changed. But we want to know why it has been changed. There is nothing new in the idea that in the last resort sex, like everything else, is the outcome of chemical processes, which might also be called metabolic. To measure metabolic processes in the two sexes is certainly very meritorious work; but in my opinion it has not led a single step towards an understanding of the problems of sex-determination, although the methods used are quantitative in nature.

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## THE ORIGIN AND ANTIQUITY OF MAN; A CORRECTION

My colleague, Aleš Hrdlička, in a letter dated May 23, 1927, has courteously called my attention to two or three serious errors in my article entitled "Recent Discoveries relating to the Origin and Antiquity of Man," which appeared in *SCIENCE* on May 20. I deeply regret that these errors and omissions should have been overlooked in correcting the proof and I find they are not due to mistakes of the printer.

On page 484, right column, last sentence: "We

consequently reach an entirely new estimate of the brain capacity of the human race at the close of Pliocene time and the beginning of Pleistocene time, a period estimated at between 1,250,000 to 1,600,000 (not 1,000,000,000) years before our era."

On page 484, right column: The statement, "This Dawn Man has a flat vertical forehead like the modern Bushman. . . ." is correct.

On page 485, left column, and on page 488, left column: The tables should have had the word 'Minimum' prefixed to the measurements of existing native and European races; as it is, the figures give a false impression. The three races especially concerned in these tables are the 'native Indian Veddahs,' the 'living broad-head race of Czechoslovakia,' and the 'average modern Swiss.' The mean, minimum and maximum, male and female ccm. brain capacity of these races is as follows:

	Male			Female		
	Mean	Min.	Max.	Mean	Min.	Max.
Native Indian Veddahs .....	1250	1012	1408	1139	1037	1217
Living broad-head race of Czechoslovakia .....	1415	1230	1800	1266	1000	1400
Average modern Swiss .....	1467	1200	1660	1349	1230	1510

In the above measurements in my article of May 20, assembled by my colleague, Dr. H. L. Shapiro, it will be observed that comparison was made between the skull capacity of the Stone Age races and the *minimum* capacity of existing races, namely the 'native Indian Veddahs,' min. male 1012, min. female 1037; the 'living broad-head race of Czechoslovakia,' min. male 1230, min. female 1000; the 'average modern Swiss,' min. male 1200, min. female 1230.

Dr. Hrdlička remarks, "it is a general law that the males of any people exceed the females in capacity by from 150 to 200 ccm." also, "Finally on page 488 left column you give the capacity of the living broad-head race of Czechoslovakia as 1230 ccm. for the males and 1000 ccm. for the females—which is quite incorrect, the capacity of these people, stature for stature, equaling and even exceeding (see Weisbach) that of other European nations." Unfortunately, we do not know the sex of either the Piltdown or Trinil races. In the Neanderthaloid races, the female Gibraltar brain is known to be inferior in capacity to the male Neanderthal.

Finally, the general contention of my article is sustained, namely that at the close of Pliocene and the beginning of Pleistocene time, a cube of brain capacity was attained not quite equaling the minimum existing capacity.

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MAY 26, 1927