

S.L. Washburn and F.C. Howell. Human Evolution and Culture. The Evolution of Man. (ed.) Sol Tax, Univ. of Chicago Press, 1960. p.47

**Q 32**

It may well be that the basis for the hominid adaptive radiation was both bipedalism and the use of implements. Each is so intimately, causally associated with the origin of man that it is perhaps meaningless to speak of one without consideration of the other.

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In the Middle Pleistocene there is abundant evidence that men fashioned excellent stone implements in standardized forms by well defined traditions, knew the use of fire, used fire-hardened wooden spears, and killed some large animals.

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THE EXPANDING BRAINCASE

When the existing anthropomorphous apes are compared with living man, one of the greatest differences is in the size of the brain. Thus, the area of cerebral cortex in the chimpanzee is only about one-fourth that of the surface area in man, although in the former the convolutions are well marked and have a disposition similar to man's and the cyto-architecture is nearly identical in both. Not only is the brain of man approximately three to four times as large but it is the particular pattern of cortical development, and relations with diencephalic structures, which makes human life as we know it possible. Language, memory, motor skills, foresight, complex social organization, and art are all specific human attributes related to the structure and function of the brain.



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The approximate changes in gross size of the hominid brain, as measured by cranial capacity (in cubic centimeters), during the Pleistocene are summarized below.

Table 2.

Representative Cranial Capacities\*

<u>Homo sapiens</u>	1200-1500 cc.
Java and Pekin man	900-1100 cc.
Australopithecines	450-550 cc.
Chimpanzee	350-450 cc.

\* From Washburn (1959).

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The important point is that size of brain, insofar as it can be measured by cranial capacity, has increased some threefold subsequent to the use and manufacture of implements. Erect, bipedal hominids, capable of making and employing tools, existed early in the Pleistocene when the brain was no larger than that of the existing apes.



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