THE SKELETON OF THE FOSSIL INFANT FOUND IN SHANIDAR CAVE, NORTHERN IRAQ

-Preliminary Report-

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Mr. Ralph Solecki, the director of the Shanidar cave expedition (1956—1957) sponsored by the Smithsonian Institution of Washington, D.C., and financed by the Smithsonian Institution, Wenner-Gren Foundation, Columbia University and the American Philosophical Society, invited me to Baghdad to study and report on the remains of a fossil infant found by him in 1953, during an excavation conducted on behalf of the Smithsonian Institution and the Department of Antiquities of the Iraq Government. I went to Baghdad on 22 December 1956 and remained there until 10 January 1957, and studied the remains of the fossil infant, which is now housed in the Iraq Museum.[1]

The fossil infant was found by Mr. Solecki in the Mousterian stratum, Layer D, of Shanidar cave, in northern Iraq, at a level where a few "Emireh" points turned up.[2] The geological age of this Palaeolithic infant lies somewhere between Würm I and Würm II,[3] but until the fauna from this layer is fully analyzed or until the definite geological dates of the contemporary Palaeolithic cultures

[1] I wish to extend my thanks to Mr. Ralph Solecki and the American institutions supporting the Shanidar expedition for a grant to meet my expenses in Iraq and to the Faculty of Language, History and Geography of the University of Ankara for a grant for a round-trip flight to Baghdad and to His Excellency Dr. Naji al Asil, the Director General of Antiquities of Iraq for permission to study the remains.

[2] See Solecki, R. S. 1955. The Shanidar cave, a Paleolithic site in northern Iraq. The Smithsonian Report for 1954, Washington, D.C., pp. 389-425. However, according to Solecki the Mousterian industry of this cave continues for awhile above the horizon where the "Emireh" points were encountered (see Solecki, 1955, p. 421).

[3] For a discussion of geological age see, ibid., pp. 420-421.

of Palestine and Syria are determined, a more precise date cannot be fixed.

The fossil infant is represented by some cranial fragments appertaining to the vault, some postcranial bones or bone fragments and 16 teeth. Of the sixteen isolated teeth which, from a comparative point of view, form the most instructive parts of this largely decomposed skeleton, fifteen belong to the deciduous dentition and one is the broken germ of a first upper left permanent molar. The stage of development and the inferred state of eruption of the teeth correspond to that of a European child of approximately nine months of age, as was also concluded by Dr. D.F. Veldkamp of the Royal Dental College of Baghdad to whom the teeth had been shown in 1953.[4] However, as we are dealing here with a fossil infant, I estimate that the actual age was probably slightly under 9 months. Although, in the case of a single example of a fossil form, especially one as young and as fragmentary as this one, it is not possible to determine the sex with certainty, the size of the teeth seems to favor the assumption that it may belong to a girl.

The robustness values of the deciduous teeth are smaller than those of the known forms of Neanderthal man, including the Skhūl population of Palestine, with the exception of the upper canine and the first and second lower incisors and in the range of modern man. The teeth are, relative to length, higher than those of the Neanderthal man in most cases, in which the Shanidar infant agrees with modern man.

The upper first and second deciduous incisors are shovel-shaped, a trace of a shovel being also observed in the first lower incisor. In the incisors, in occlusal view, the buccal surface is more convex than the norm for modern man. In all incisors the distoincisal corner is strongly receding. The form of the upper lateral incisor is of special interest. In upper lateral incisor, the incisive edge is strongly convex and very short. The distal and mesial borders, instead of converging in the direction of the root from the immediate vicinity of the cutting edge as they usually do in recent man, first diverge, the distal border

[4] See Solecki, R. S. 1953. The Shanidar cave sounding, 1953 season, with notes concerning the discovery of the first Paleolithic skeleton in Iraq. Sumer, Vol. IX, No. 2, p. 231; Solecki, 1955, p. 419.

making a distinct angle between the middle of the crown and the cervix. The mesial and distal sides, in buccal or lingual view, begin to converge toward the root only from the level of this angle on. The form of this upper lateral deciduous incisor differs from the norm for modern man and also that of the Krapina Neanderthals.[5]

The upper and lower milk canines are caniniform, the tip being well-developed. The relief of the lingual surface of the upper canine is more complicated than the norm for modern man. The lower canine possesses a distinct distal tubercle, which rises as a small triangular eminence at the end of the distal edge of the tip, where it makes an angle with the distal side of the crown. In this feature the lower canine of Shanidar infant approaches that of some of the australopithecines of South Africa,[6] and differs from that of modern man, Skhūl I[7] and Peking man.[8]

The upper first deciduous molar is strongly molarized with a well-developed hypocone. The hypocone is a real cusp and not a merely thickened part of the distal margin as is the case in Skhūl I specimen.[9] In the Shanidar tooth the hypocone has a mesial ridge, a distal ridge and a relatively well-developed central ridge extending in buccal direction to a point somewhat lingual to the middle of the crown, behind the oblique ridge. The distal ridge of protocone (lingual element of the oblique ridge) starts from the buccal surface of protocone, below the tip and immediately behind the central ridge of this cusp, and goes disto-buccally to join the well-developed central ridge of metacone. The oblique ridge thus formed is stronger than the norm for modern man. In modern man the oblique ridge

[5] See Gorjanović-Kramberger, K., 1906. Der diluviale Mensch von Krapina in Kroatien. Ein Beitrag zur Paläoanthropologie, Wiesbaden, pl. IV, fig. 3.

[6] See Broom, R. 1950. The genera and species of the South African fossil ape-men. American Journal of Physical Anthropology, Vol. 8, N. S., No. 1, fig. 1 and Robinson, J. T. 1954. The genera and species of the Australopithecinae. American Journal of Physical Anthropology, Vol. 12, N.S., No. 2, fig. 6.

[7] See McCown, T.D. and Keith, Sir A. 1939. The Stone Age of Mount Carmel. The fossil human remains from the Levalloiso-Mousterian, Vol. II, fig. 137 F.

[8] See Weidenreich, F. 1937. The dentition of Sinanthropus pekinensis: A comparative odontography of the hominids. Palaeontologia Sinica, New Series D, No. 1 (Whole Series No. 101), Peiping, pl. XXI, figs. 188-189.

[9] See McCown and Keith, 1939, pp. 303-304, fig. 139A and pl. XIV, fig. 7.

of the first upper milk molar usually starts from the tip of protocone, at first travels distally or slightly disto-buccally and then abruptly turns buccalwards. In modern man the main part of the oblique ridge, when developed, is usually perpendicular to the antero-posterior axis of the crown. On the other hand, in the Shanider tooth the oblique ridge from the protocone end on follows a disto-buccal course with a slight concavity toward the anterior, as is usually the case in the second upper milk molars of modern man.

The first lower deciduous molar of Shanidar infant does not differ from that of some modern men. The right first deciduous molar has a mesoconid (hypoconulid), which is lacking in the left tooth. The morphology of the mesial marginal ridge is advanced,[10] in contrast to that of Peking man which is more primitive in this respect.[11]

The shape of the upper second deciduous molar in occlusal view, is nearly square. In this tooth the buccal section of the mesial marginal ridge, in occlusal view, is flatter than the norm for modern man and also than that of Skhūl I, in which this part is rather convex.[12] In this tooth the protocone is the largest cusp, followed by metacone, and then paracone which is only slightly larger than the hypocone. The hypocone is large, with a well-developed central ridge extending in buccal direction to a point, behind the oblique ridge, just short of the midline. In having a well-developed hypocone, the Shanidar tooth makes an approach to that of some Neanderthalians.[13] The distal main ridge of protocone, as in dm^1, starts from

[10] For the morphology of the mesial marginal ridge of the first lower milk molar of modern man see: Jorgensen, K. D. 1956. The deciduous dentition. A descriptive and comparative anatomical study. Acta Odontologia Scandinavica, Vol. 14, Supp. 20, Kobenhavn, pp. 101-102.

[11] See Weidenreich, 1937, pl. XXI, fig. 194.

[12] See McCown and Keith, 1939, pl. XIV, fig. 8.

[13] See Buxton, L. H. D. 1928. Excavation of a Mousterian Rock-shelter at Devil's Tower, Gibraltar. Human Remains. Journal of the Royal Anthropological Institute of Great Britain and Ireland, Vol. LVIII, pl. IV, fig. B; Fraipont, C. 1936. Les hommes fossiles d'Engis. Archives de l'Institut de Paléontologie Humaine, Mémoire 16, Paris, pl. III, fig. 17; Virchow, H. 1920. Die menschlichen Skeletreste aus dem Kämpfe'schen Bruch im Travertin von Ehringsdorf bei Weimar, Jena, pl. V, fig. 4; Gorjanović-Kramberger, 1906, pl. IV, figs. 2 and 3; Jorgensen, 1956, p. 126.

the buccal surface of protocone, below the tip and distal to the central ridge of this cusp, follows a disto-buccal course and joins the strong central ridge of metacone which follows a mesio-lingual course. The oblique ridge thus formed is strongly developed, wall-like and straight. The mesio-distal main groove cuts this oblique ridge at a point slightly lingual to the middle, forming a notch on top of the ridge. In addition to this, there are two more indentations or notches, one next to protocone and the other immediately adjacent to metacone. Between these lateral indentations and the more centrally located one over which the main mesio-distal groove travels, the oblique ridge presents two slight elevations in occlusal direction. This tooth possesses a well-formed Carabelli fossa resembling that of some Neanderthalians [14] and Skhūl I specimen,[15] a form which I have also observed in some ancient Anatolians.

In the second lower deciduous molar of Shanidar infant, all the corners are rounded off recalling that of Engis child. [16] The mesial and distal margins are convex and short and the buccal and lingual surfaces, in occlusal view, are strongly convex. On the buccal surface the vertical grooves separating the protoconid from the hypoconid and the latter from the mesoconid are deep and in V-shaped valleys, in which the Shanidar infant differs from the norm for modern man and approaches the Gibraltar child, [17] Peking man [18] and some anthropoid apes. The central ridges of the metaconid and protoconid unite and form a strongly developed bridge. This bridge, forming the distal wall of a well-developed fovea anterior, is cut by the main mesio-distal groove at its middle, where this groove forms a notch in the bridge. The chewing surface presents a modified Dryopithecus pattern and is conspicuously wrinkled. At the disto-buccal corner of the mesoconid is seen a distinct thickening or ridge, rising from the base of the crown toward the tip of mesoconid. A similar vertical ridge is also observed on the disto-buccal

[14] See Gorjanović-Kramberger, 1906, pl. IV, fig. 3; Buxton, 1928, pl. IV, fig. B.

[15] See McCown and Keith, 1939, pl. XIV, fig. 8.

[16] See Fraipont, 1936, pl. III. fig. 16. This tooth is labelled by Fraipont as a left second lower milk molar, but it clearly belongs to the right side.

[17] See Weidenreich, 1937, pl. XXII, fig. 209.

[18] See ibid, pl. XXII, fig. 202b.

corner of the small mesoconid of a second lower milk molar from Salmendingen, which is commonly attributed to *Dryopithecus rhenanus* Pohlig. [19] In the Shanidar tooth, in front of the tip of entoconid an accessory elevation, or tip, is developed on the mesial ridge of this cusp, a feature which occurs rarely in modern man. This feature occurring in Shanidar infant and rarely in modern man must be regarded as a specialization.

Some features of the deciduous dentition of Shanidar infant have been briefly outlined. While in some features the deciduous dentition of Shanidar infant approaches that of the Neanderthal man and in some comes closer to modern man, it also possesses characteristics which distinguish this fossil form from both the Neanderthal man and modern man. The milk teeth of this fossil infant display both primitive, or archaic, and specialized features. These primitive traits retained in the Shanidar form must have been present in the deciduous dentition of the common ancestors of genus *Homo* and lost during the course of evolution of Neanderthalians and modern man.

The deciduous dentition of Shanidar infant does not only differ from those of the Neanderthalians of Europe and modern man, but also from that of Skhūl I, which belongs to the Mount Carmel population that bridges over the morphological gap between the Neanderthalians of Europe and modern man. [20] In other words, Shanidar

[19] See Hürzeler, J. 1951. Contribution à l'étude de la dentition de lait d'Oreopithecus bambolii Gervais. Eclogae Geologicae Helvetiae, Vol. 44, No. 2, fig. 3.

[20] Regarding the Mount Carmel population of Palestine, Mayr (Mayr, E. 1950. Taxonomic categories in fossil hominids. Cold Spring Harbor Symposia on Quantitative Biology, Vol. XV, Cold Spring Harbor, L.I., New York, p. 112) states: "*In Palestine the Mt. Carmel finds belong to a population that combines some features of Neanderthal with some of modern man. It is immaterial whether we interpret this as a hybrid population, as an intermediate population, or as a population ancestral to both. The fact remains that Mt. Carmel man makes the delimitation of modern man from Neanderthal exceedingly difficult, if not impossible, as pointed out by Dobzhansky (1944)*".The evidence of Mount Carmel population thus shows that the Neanderthalians and modern man belong to one species, viz., *Homo sapiens*, as has been correctly concluded by Dobzhansky and Mayr (See Dobzhansky, T. 1944. On species and races of living and fossil

infant belongs to a new form of Mousterian, or Upper Pleistocene, man that differs from the Neanderthal man of Europe, Skhūl population and modern man. But still, this new Mousterian form of man, the Shanidar form or Shanidar man, also possesses some features from which it appears that it was closely related to the ancestors of modern man.

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man. American Journal of Physical Anthropology, New Series, Vol. 2, pp. 251-265 and Mayr, 1950, p. 113).

Dobzhansky classifies the Neanderthal man as *Homo sapiens neanderthalensis*, that is he places all the Neanderthalians in one subspecies (Dobzhansky, T. 1955. Evolution, Genetics and Man, New York, p. 331). However, it must be pointed out here that in the Neanderthal group of the species *Homo sapiens*, as has been ably shown by Howell, there is considerable variation, both horizontal and vertical (see Howell, F. C. 1951. The place of Neanderthal man in human evolution. American Journal of Physical Anthropology, Vol. 9, N. S., No. 4, pp. 379-415). Therefore, there are indications that there were more than one subspecies in this ancient group of *Homo sapiens*.