

(7) AMNH 19590, *H. theobaldi*, left upper molar, Brown 1922, from "1 mile north of Chinji Bungalow". Such a locality would be in the Chinji.

(8) AMNH 19661, *H. antelopinum*, teeth and jaw fragments, collected by Brown in 1922, from "Lower Siwaliks-quarry $\frac{1}{2}$ mile south of Dhok Pathan". This locality is in either the Dhok Pathan or Nagri zones.

If the locality data were accurate and reliable, the first appearance of *Hipparion* would have to be placed before Chinji time on the basis of one specimen, or possibly two. Its presence in the Chinji would be documented by, at most, three specimens; definite documentation, if the accompanying record is reliable, would be provided only by one specimen. It thus seems that a correlation based on the occurrence of *Hipparion* in the Chinji cannot be justified, and that Pilgrim's relative dating⁶ based on the remainder of the fauna is acceptable.

Should *Hipparion* have first appeared in the Siwaliks in beds of Nagri age as seems to be the case, then the Chinji deposits can be dated between about 12 and 15 million years; the youngest Nagri beds are probably 9 or 10 million years old. Thus *Dryopithecus* and *Ramapithecus* species from India and Pakistan span a period of some 4 to 6 million years. The oldest *Ramapithecus punjabicus* specimens from the Chinji horizons are therefore probably as old as the East African *Ramapithecus* from Fort Ternan in Kenya, dated radiometrically to around 14 million years².

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Syphilis and Neanderthal Man

BONE changes in Neanderthal remains which, it has been suggested¹, might be caused by rickets are not unlike those seen in certain treponemal diseases, notably congenital syphilis. Examining the Neanderthal collection at the British Museum (Natural History), I noted several features compatible with treponemal disease.

The Olympian brow, Parrot's nodes and Caput Quadratum are all examples of "bossing"² of the congenital phase of syphilis. These changes are well marked in the Gibraltar II and in the original Neanderthal skull and also appear in the descriptions of Staroselje³ and Pech de l'Aze⁴ remains. The thinning and pitting of the occipital and parietal areas with the relative depression of the bridge of the nose ("saddle nose") may support a diagnosis of a generalized syphilitic osteo-

myelitis. It is interesting that these changes persist into adult life. These changes were seen in both adult and child skulls.

The frequent lack of incisors and well worn flattened taurodont molars superficially suggest the crateriform decay of Moon's mulberry molars⁵, which are seen in congenital syphilis. Examination of the inner aspect of the calvarium shows no increase in vascular markings, making an external hydrocephalus unlikely. Some authorities have suggested, however, that there is evidence of a healed meningitis occurring⁶.

It was the inspection of the curves of the long bones, in particular, the backward curves of the femur and perhaps the changes at the metaphysis, that first made Virchow⁶ express his view that Neanderthal man was none other than *H. sapiens* with rickets. The effect of a syphilitic osteitis could produce these bone changes and might, in addition, account for the Neanderthal long bones being so short and stout⁷. Bowing of the tibiae¹ has also been described but was not present in the specimens I examined.

In societies with poor nutrition, rickets and congenital syphilis frequently occur together. The distinction between the two is extremely difficult without modern biochemical, serological and radiographic aids⁸. The degree of confusion can be gauged by Parrot's untrue aphorism "without hereditary syphilis, there is no rickets"⁹. If rickets were widespread in Neanderthal man, osteomalacia would occur in the adult female pelvis, making parturition exceptionally difficult. There was, however, no evidence of this in the Neanderthal and Tabun specimens, or in innominate bones examined by other workers¹⁰.

The oldest treponemal disease known at present is pinta (caused by the organism *Treponema carateum*) which dates back 15,000 years¹¹. The changes described in Neanderthal man may thus provide a possible link between the human and the yaws-like treponemal disease found in monkeys¹².

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Non-ferritin Iron Compound in Rat Small Intestinal Mucosa during Iron Absorption

THE transfer of iron across the mucosal cells of the small intestine is an active metabolic process, and part of the iron taken up by the cells is rapidly delivered to the plasma while some of the remaining iron is deposited as ferritin¹. A study of the subcellular distribution of orally administered ⁵⁹Fe in