TWO CASES OF TAURODONTISM IN MODERN HUMAN JAWS

BY

J. J. MANGION, M.D., B.SC., F.D.S.

(*Royal University of Malta*)

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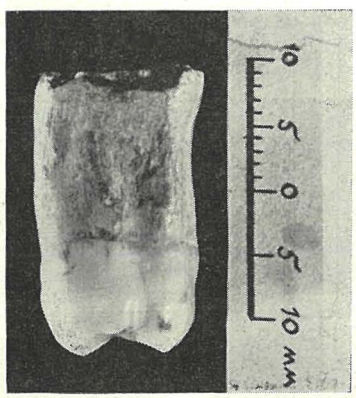
Two Cases of Taurodontism in Modern Human Jaws

J. J. MANGION
M.D., B.SC., F.D.S.
Royal University of Malta

TWO cases of advanced taurodontism in molar teeth of Maltese patients have come to the author's attention. In view of the controversy concerning the interpretation of the occurrence of taurodontism in human jaws, it is considered of interest to publish descriptions of these teeth in the hope of stimulating other members of the profession to put on record any chance discovery of this type of tooth. A collection of such records from various ethnic areas would eventually lead to a proper evaluation of the significance attached to this morphological pattern of dentition.

In his article entitled 'Neanderthal Man in Malta,' Sir Arthur Keith (1924) based his assumption that Neanderthal man existed in Malta on the discovery of two taurodont teeth at Dalam Cave (Ghar Dalam). These teeth, which Keith described as exact replicas of the Krapina molars, are now preserved in the National Museum in Valletta (fig. 1). It is largely on the evidence of these teeth that Keith claims that Neanderthal man lived in Malta in the terminal phase of the Mousterian Period.



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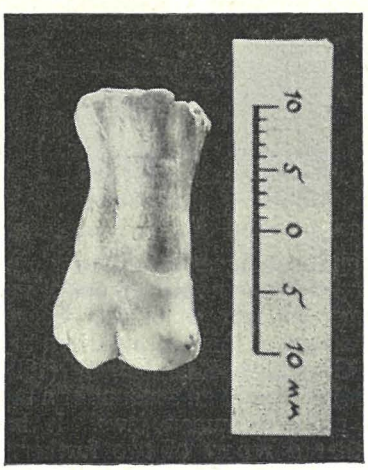

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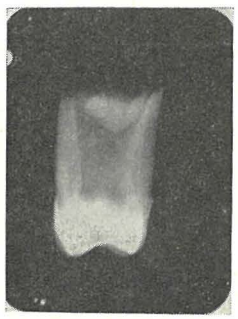

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D

FIG. 1.—Photographs and radiographs of right upper molar found at Ghar Dalam. A, Anterior aspect. B, Lateral aspect. C, Mesio-distal radiograph. D, Bucco-lingual radiograph.

Certain morphological characteristics of teeth are genetically determined and they provide valuable material for ethnological studies and for evaluating the theoretical problems of the evolution of man. Keith coined the term 'taurodontism' for such molars in which the body of the tooth enlarged at the expense of the roots; a condition which is different from fusion of the roots and from pyramidal roots (Brabant and Kovacs, 1961). Figure 2 is Keith's diagrammatic representation of developmental stages of the formation of the pulp chamber and roots of a molar tooth of a modern European man and those peculiar to Neanderthal man.

Keith held the view that taurodontism was a distinctive characteristic of Neanderthal man, and the presence of such a type of tooth was sufficient for him to exclude that fossil form from the ancestral line of modern man. Moreover, he maintained that the modern cynodont tooth could not have evolved from a taurodont tooth and regarded 'Homo Neanderthalensis' as a separate species, now extinct, representing an offshoot of the human family. On the strength

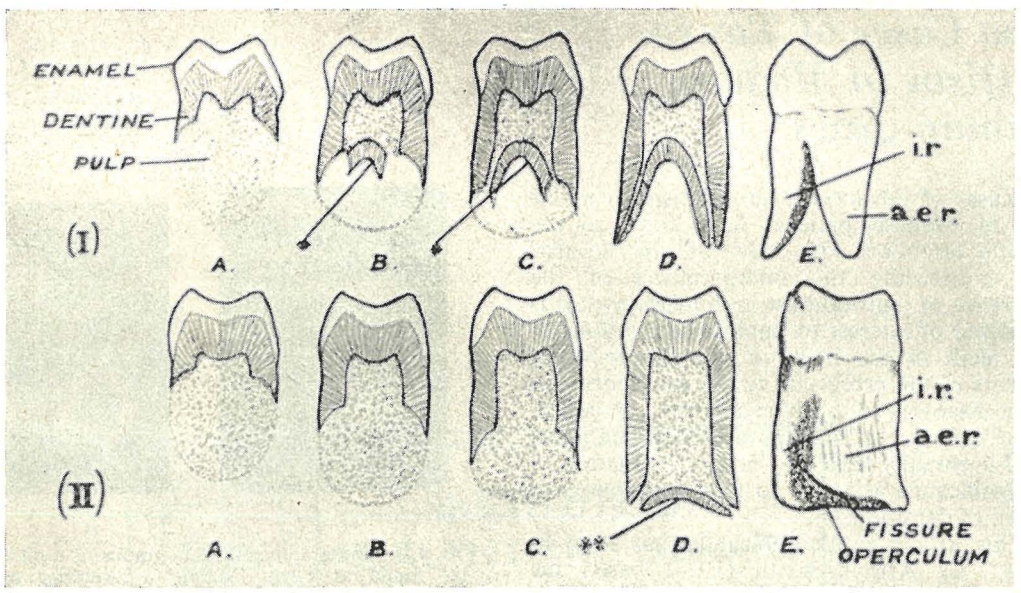
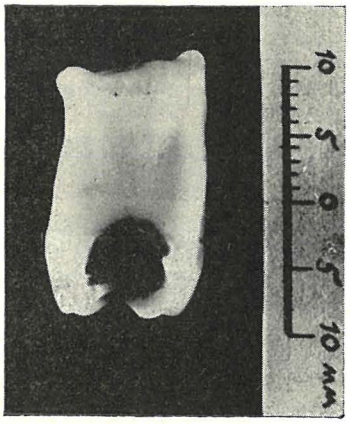


FIG. 2.—Diagram of the formation of the pulp chamber and roots of cynodont and taurodont teeth reproduced from Keith. (*By permission of the Royal Anthropological Institute of Great Britain and Ireland from J. roy. anthrop. Inst.*, **54**, 252.)



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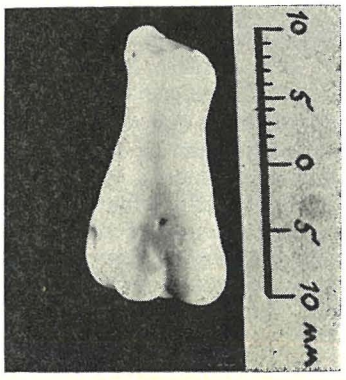

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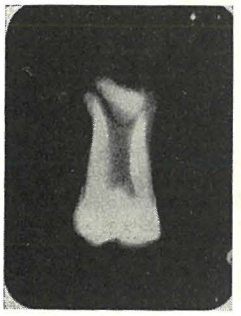
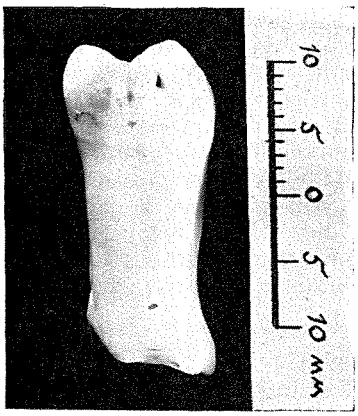


C D

FIG. 3.—Photograph and radiograph of right upper first molar tooth. A, Anterior aspect. B, Lingual aspect. C, Mesio-distal radiograph. D, Bucco-lingual radiograph.

of further evidence this view is still in favour (Vallois, 1954; Boule and Vallois, 1957) even though anthropologists have not completely solved the riddle of man's ancestry and the genealogical position of that Mousterian fossil.

Although the designation of taurodontism has been included in the nomenclature of textbooks of anatomy, yet records of the occurrence of advanced stages of this tooth pattern are scarce indeed. Gorjanovic-Kramberger (1908) and Lunt (1954) both give an account of a taurodont tooth in modern human jaws. It has been thought that a report of two further modern specimens would be of interest to the students of atypical morphological varieties of human dentition.



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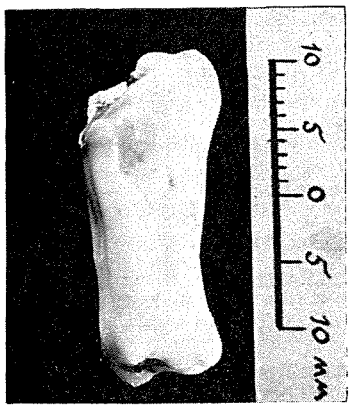

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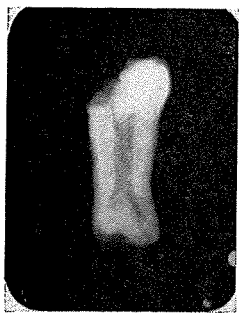

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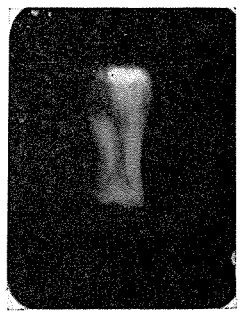

D

FIG. 4.—Photographs and radiographs of right lower first molar tooth. A, Posterior aspect. B, Lingual aspect. C, Mesio-distal radiograph. D, Bucco-lingual radiograph.

Both teeth were extracted because of acute pain arising from extensive mesio-occlusal caries with exposure. The first case is that of *molar A* (fig. 3) extracted in my early practice. The tooth is a right upper first molar. It is regretted that no details are available; from memory, the patient was a male in his twenties; the measurements of the tooth are given below.

FIG. 5.—Lateral oblique radiograph showing the tooth, depicted in fig. 4, in position.

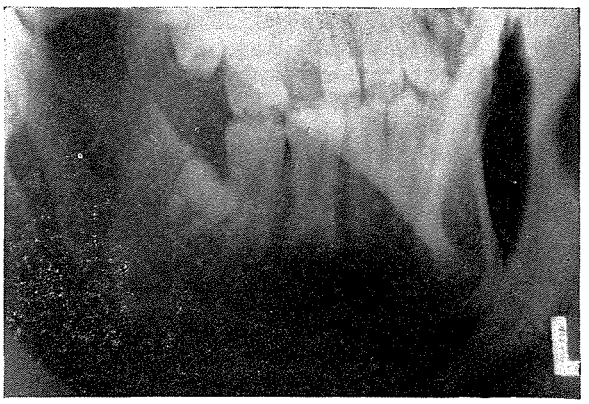

FIG. 6.—Lateral oblique radiograph showing similar condition on left side.

The second case, that of *molar B* (fig. 4), is even more interesting as radiographs of the tooth *in situ* were taken before extraction. The case was referred to me by another practitioner who encountered considerable difficulty in attempting extraction of the right lower first molar. The radiograph (ffg. 5) was taken some time after the attempted removal of the tooth; this accounts for the abnormal appearance of the bone around the apex of the tooth.

Radiographs of the opposite side of the jaw showed the presence of the same morphological condition (fig. 6).

The measurements of the teeth are given with the exception of those that would involve points where structure was lost due to decay:

		Molar 'A'	*Molar 'B'*
Length (crown and body)	Mesio-buccal	—	—
	Mesio-lingual	18·9 mm.	—
	Disto-buccal	20·1 mm.	25·1 mm.
	Disto-lingual	19·0 mm.	24·0 mm.
Length of body	Mesio-buccal	11·8 mm.	17·4 mm.
	Mesio-lingual	12·6 mm.	14·9 mm.
	Disto-buccal	12·0 mm.	16·5 mm.
	Disto-lingual	13·2 mm.	15·9 mm.
Diameters at the amelo-cemental junction	Mesio-distal	8·5 mm.	8·9 mm.
	Bucco-lingual	11·4 mm.	10·4 mm.
Diameter of body at the most constricted part	Mesio-distal	6·0 mm.	7·5 mm.
	Bucco-lingual	10·4 mm.	8·1 mm.

The object of this paper is to call attention to two modern examples of an advanced stage of taurodontism in molar teeth. It is not, however, my intention here to claim that any conclusions can be based on the fortuitous incidence of morphological traits in human dentition which are of common occurrence in the fossil remains of the Neanderthalians. Taurodontism has been ascribed the significance of a specialised or retrograde character (Adloff, 1908), a primitive pattern (Gregory, 1921), a Mendelian recessive (Shaw, 1928) or an atavistic feature (Hrdlicka, 1914). According to Brabant and Kovacs (1961) 'il représente sans doute une mutation' resulting from odontoblastic deficiency during dentinogenesis of the roots.

Keith also maintained that minor degrees of taurodontism may be found in modern human races. The literature on this morphological condition of the teeth has been slowly accumulating. In point of fact Shaw (1928) described hypotaurodontism and mesotaurodontism in South African races, Pedersen (1949) in the East Greenland Eskimoes, and Moorrees (1957) in the dentition of the Aleutian Islanders. Furthermore, I am convinced that a variable degree of this pattern of teeth is also found in the Maltese dentition.

It is hoped that further studies will be made of tooth morphology and odontometry in various localities and on different racial groups; so that, while anthropologists in their endeavour to reconstruct man's ancestral lineage are laboriously disembowelling the lowermost strata of the earth, searching for elusive fossil teeth, the dental profession can also play a part by providing statistical data of the reappearance of dental characters which are in the process of suppression in the evolution of civilised mankind.

ACKNOWLEDGMENTS

In conclusion I wish to thank Professor C. Coleiro, the Chief Government Medical Officer, for permitting the publication of the second case treated at St. Luke Hospital. I am very grateful to Captain J. Zammit, the Director of the National Museum, Valletta, for giving me all the assistance available in his Department. My thanks are also due to Mr. J. Spiteri, of that same department, for the photographs of the teeth.

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