next to the lost tooth in tension. Initially, this device may have been employed only on the teeth closest to the missing one. However, more teeth eventually may have been included within the gold band. In this way, teeth on both sides of the missing tooth underwent mechanical stress, resulting in continuous remodelling of the alveolar bone. Thus, shifting of teeth adjacent to the lost one may have occurred until the diastema closed.

This is a plausible, although difficult to prove, hypothesis. Etruscan dentists performed orthodontic interventions with provisional equipment. Yet, the orthodontic function of the gold strip is possible if we consider the technological level that the Etruscans reached. The gold strip may have been left on the teeth as an ornament after its potential mechanical function was completed. Thus, a therapeutic function may have been associated with an aesthetic one, which perhaps was related to the use of gold as a feminine ornament.

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What Are Mulberry Molars?

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In 1987 Jacqueline A. Turner and I spent five months collecting dental and other anthropological data in six institutions, laboratories, and museums in Moscow, St. Petersburg, and Novosibirsk, Russia; and Tallinn, Estonia. At the Institute of Ethnography in St. Petersburg, we studied several skeletal series. One of these, a series of 145 historic Russians, was especially noteworthy because of the presence of numerous dental and osteological pathologies and anomalies, including what appeared to be extensive syphilis. The series had been excavated during the 1950's by the late Academician Valeri Alekseev (1969) from a presumed Russian Orthodox cemetery located inside Sebezh, Russia, a city south of Pskov near the Latvian border. Mortuary offerings of datable coins suggest that the cemetery had been in use during the 18th century—at least 200 years after syphilis was supposed to have been introduced to Europe from the Americas.

Figures 1-A, 1-B, and 1-C illustrate the severely malformed first permanent molars, and slightly hypoplastic deciduous second molars of a six to seven year-old Sebezh child. Figure 1-D shows one of the adult crania, several of which had marked syphilitic lesions.

The occlusal surfaces of the child's permanent molars possess numerous supernumerary ridges and *cusps*. Deep furrows are associated with the supernumerary ridges, and pitting occurs on the cusps. Some of this extra pitting can be seen on the deciduous second molars (Figs. 1-A, 1-B, 1-C). The unerupted second permanent molars also appear to be hypoplastic, but to a lesser degree than are the deciduous teeth.

The hypoplasia probably exposed the deciduous molars to increased risk of caries because of the pitting and uneven enamel formation. The mandibular left deciduous molar has occlusal and buccal surface caries (Fig. 1-A). The mandibular right deciduous tooth also appears to be carious in the deep occlusal furrows (Fig. 1-B). There are no caries on the permanent molars because they had erupted only a few months before death. The mandibular left permanent molar has only one cusp tip (cusp 1, protoconid) with any exposed dentine. Calculus deposits are extensive, as can be seen on the maxillary right deciduous molar (Fig. 1-C).

Massler and Schour (1952:plate 16), in their discussion of teeth with congenital syphilis, note that the disease can affect only the teeth developing during neonatal and early infancy periods. "Therefore, the permanent incisors, cuspids and first molars, which are at the stage of *morphodifferentiation* at the time of the [infection] show a disturbance in *tooth form*; the deciduous teeth, which are active in the *formation of enamel* and dentine show *hypoplastic defects*, but no effects upon tooth form; whereas the bicuspids and permanent second and third molars, which are still in the bud stage, are usually not affected at all." Although the incisors are missing from the specimens illustrated in Figs. 1-A, 1-B, and 1-C, the deciduous and permanent molar condition matches Massler and Shour's developmental description.

Inasmuch as several of the adult crania (post-cranial bones were unavailable for study) exhibited what looked like advanced stages of syphilis, the question in my mind is: should the child's molar teeth illustrated in Figs. 1-A, 1-B, and 1-C be considered as mulberry or syphilitic molars?

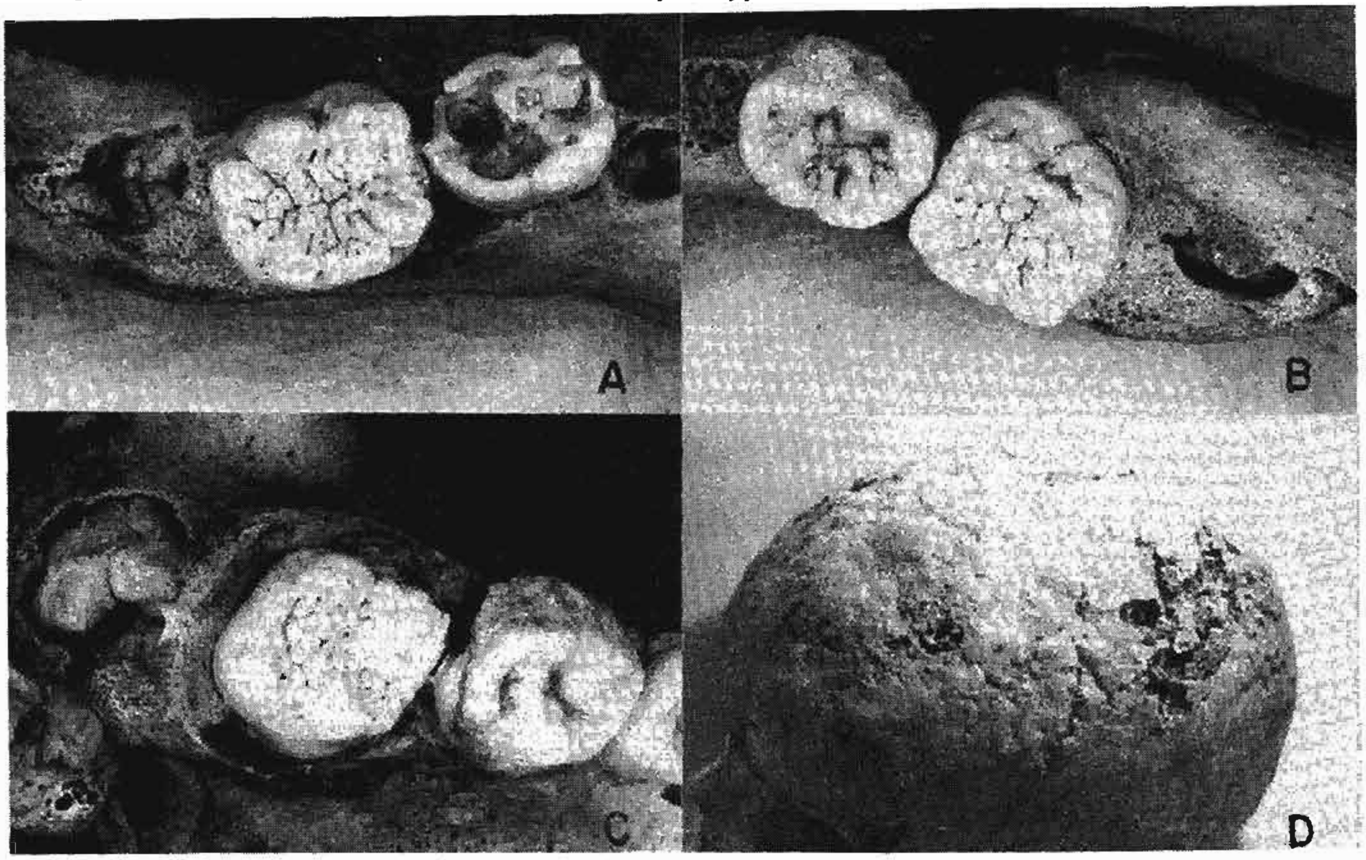

Fig. 1. A. Left mandibular molars of Sebezh child 6536-122 showing marked developmental anomalies of the occlusal surface (CGT neg. no. 35/4-2-87). B. Right side of same individual in Fig. 1 showing similar amount of occlusal hypoplasia (CGT neg. no. 34/4-2-87). C. Right maxillary molars of Fig. 1 individual (CGT neg. no. 32/4-2-87). D. Adult male (?) 6536-47 Sebezh Russian cranium with advanced syphilitic lesions (CGT neg. no. 13/4-2-87)

I raise this question for two reasons. First, I have never personally seen or handled a documented example of a mulberry molar or a Hutchinson's incisor, both of which are said to be caused by congenital syphilis (Sarnat and Shaw, 1942; Massler and Schour, 1952). Therefore, I am unsure what these pathologies look like. Second, I have not seen the combination of adult osteological and childhood dental pathology, illustrated in Figs. 1-A, 1-B, 1-C, and 1-D (which together in a population suggest the active presence of the syphilis bacterium, *Treponema pallidum*) in any series of prehistoric crania of the New World. Many workers feel that syphilis originated in the New World. The evidence for this view is reviewed by Baker and Armelagos (1988) and Merbs (1992).

My questions to readers of the *Dental Anthropology Newsletter* are: Are the teeth illustrated in Figs. 1-A, 1-B, and 1-C examples of mulberry molars caused by congenial syphilis? Has anyone seen this combination of cranial lesions and severely hypoplastic molars within or among individuals belonging to a prehistoric skeletal population from the New World?

ACKNOWLEDGEMENTS

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Report: Presence of a Connate Tooth in a Neonatal Chimpanzee

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While dissecting the developing teeth from a neonatal chimpanzee, we recently found an example of a dichotomous lower tooth (connate tooth, per Miles and Grigson, 1990) comprised of the left di_1 and di_2. As seen in Figure 1, merger between the crowns appears to have occurred between the lateral border of di_1 and the medial border of di_2. The crown is complete in both with root development commenced in both central and lateral parts of the tooth. However, there is a differential in root development between medial and lateral tooth components suggesting that although merged, each component retains somewhat separate developmental parameters.

Miles and Grigson (1990) provide several examples of connate teeth including a photograph (Figure 3.9, p. 27) of one in the position of the I_2 in an adult chimpanzee. The crown of this tooth, like the one reported here, is separated only along the incisive border with the remainder of the crown combined in a single unit. Our tooth differs, however, in being a connate deciduous tooth representing combined deciduous teeth rather than a permanent connate tooth in the position of a single tooth. Ooe (1972) citing the work of others (Euler, 1939; Thoma, 1960) notes that connate teeth are more likely to appear in the deciduous dentition, most commonly involving the lower incisors as seen here (Hachisuga, 1938; Ito, 1939; Saito, 1959; Yuasa, 1944).

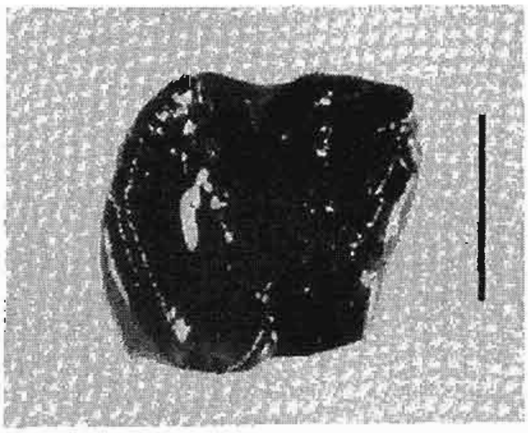

Figure 1. A lingual view of a connate deciduous incisor (combined left di_1 and di_2) in a newborn female chimpanzee (Yerkes specimen 87-159, property of D.R.Swindler). Scale = .5 cm. (Copyright L.A. Winkler)

Two mechanisms have been hypothesized to explain connate teeth (Miles and Grigson, 1990): 1) they represent fused or joined tooth buds as a result of development in crowded space; or 2) they are the result of partial or incomplete splitting (dichotomy) or separation of tooth primordia during early stages of development. Research has provided support for both theories. For instance, Sofaer's work (1969) with mice appears to support crowding, hence fusion, whereas Ooe's work (1972) on humans provides evidence supporting the incomplete separation or dichotomy theory. Berkovitz et al. (1973) have found evidence in their work with ferrets to support the occurrence of both mechanisms. Based on the accumulation of evidence implicating both mechanisms in the development of connate teeth, Miles and Grigson (1990, pg. 9) conclude that "not all connate teeth arise in the same way." In our opinion, studies such as those of Ooe (1972) and Berkovitz et al. (1973) on the early stages of development are crucial to identifying the correct mechanisms.

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