East Asian human evolution as the representative of north Chinese. However, the scarcity of chronological consideration of the dental remains from the late Pleistocene to Holocene decreases the strength of these theories. So, further research on Chinese specimens is necessary and will provide a reliable answer to these topics.

Therefore, the IVPP has understood the importance of dental anthropology and communication with foreign colleagues. For this reason, the present author, being a young researcher in IVPP, was sent to Arizona State University to learn dental anthropology from Dr. Christy G. Turner II. The institute is expecting to deal with dental anthropological research in the field of human evolution and the origin of modern humans. When I return to China, I hope to assemble a bibliography on Chinese dental studies. I will share it with members of the Dental Anthropology Association through our newsletter.

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Labial Tooth Wear and Culture

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ABSTRACT Surface alterations observed on the anterior teeth of prehistoric humans suggest that incisors are involved in many uses related to ingestion, manipulation, and dental care activities. These culture-related uses can be distinguished in dental remains from throughout the major periods of human evolution.

The anterior teeth are used by primates to nip leaves, berries and grubs, to gouge and peel, or as a wedge to pulp fruits. In *Papio*, the high incidence of labial surface striations and ribbon incisal wear results from tooth manipulation of small objects.

In the oldest hominid remains from Laetoli, Tanzania, and Afar, Ethiopia, dated about 3 to 4 million BP, we have not observed labial scratches or gashes. Instead incisal ribbon wear suggestive of seed grasping is exhibited (Puech and Albertini, 1984).

In early *Homo* remains from Olduvai, Tanzania, Lake Turkana, Kenya, and Omo, Ethiopia, dated 1.7-2.4 million BP, we did not observe intensive labial scratches or the ribbon incisal wear. These remains are characterized by parallel, labio-lingually oriented microscopic striations. This wear can occur when the teeth are used to open pods of small legumes or shoots that contain abrasive plant inclusions (phytoliths) (Puech, 1983). When such siliceous material is present, the stripping or scraping action required to open the pod can be very damaging to the teeth. Similarly, fibrous material pulled across the upper premolars of *Homo habilis* has produced proximal transverse grooves, causally related to therapeutic purposes (Puech and Cianfarani, 1988).

In *Homo erectus* and *Homo sapiens neandertalensis* dentitions, diagonal scratches on the labial surface of the incisors are interpreted as evidence of "stuff and cut" (Brace 1975; Puech, 1981). Meat is thought to have been held by the front teeth and one hand, while it was cut by a stone knife held in the other hand. This resulted in scratches or gashes on the teeth. These marks are oriented in such a unique direction, that we attribute them to the use of the right hand to hold the knife 90-95% of the time (Puech et al, 1989). Such characteristic scratches and gashes are virtually absent in modern humans who apparently possess better hand dexterity. In *Homo sapiens neandertalensis*, the frequent practice of removing meat from a bone by grabbing and forcefully pulling it through clenched anterior teeth, resulted in partial loss of incisal contact.

Loss of incisal contact is rare in *Homo sapiens*, but in Chalcolithic and early Bronze Age dentitions severe labial flat wear is observed on many upper central incisors. It results from a combination of chemical erosion and physical wear. This specific wear pattern affects most of the labial crown height, leaving a well-delimited gingival

enamel margin. This mutilation sometimes ends mesially in a sharpened transversal surface. It may be the result of some form of extensive tooth cosmetic preparation, since it has a temporal limitation in Eurasia.

In Bronze Age populations, we also observe many deep, vertical striations on the labial surfaces along with chipping on the incisal edges of upper *and* lower incisor teeth. Striations covering the entire surface up to the cervix indicate that the incisors were dug into objects or intentionally brushed. In addition, grooves from many potential sources are present on occlusal, proximal, and frontal tooth surfaces, but are absent from concave areas. Within these grooves are long, closely spaced microstriations that are virtually identical in size. The microstriations resulted from scratching by abrasive substances.

Tooth abrasion gives evidence of hand activity and of its type. Thus, from tooth wear we can infer prehistoric coordinated manipulation involving object transference from hand to mouth, object-substrate manipulation involving one object relative to the teeth, and complex object manipulation involving intentional change of object state.

Although early man has been shown to have considerable hand ability, *Homo erectus* and *Homo sapiens neandertalensis* apparently lacked the complex hand use evidenced by *Homo sapiens* dexterity in the early Bronze Age. During their 2.5 million years of existence, Paleolithic humans made tools and colonized the world. However, according to tooth microwear, human dexterity evolved only within the last 40,000 years. Early man was essentially a bipedal, handy hominid lacking the central cognitive characteristics of modern "sapiens" dexterity.

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The Oldest Example of Dental Filing North of the Valley of Mexico

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A recent examination of hunter-gatherer skeletal remains from the Chihuahuan desert region (Steele and Powell, 1990) has revealed a new example of dental mutilation not previously reported in the literature. This specimen, with known stratigraphic and temporal provenience, appears to be the oldest substantiated example of dental mutilation north of the Valley of México. Although cultural modification of teeth is well-documented for Preclassic, Classic, and Postclassic cultures of México and central America (Romero, 1958, 1970), there are relatively few examples of dental mutilation north of central México, and none older than approximately 1000 BP (Milner and Larsen, 1991).

MATERIAL AND METHODS

The example of dental mutilation reported here was recovered from the site of Cueva de la Zona de Derrumbes (NL92), located in the Río Santa Rosa valley in southeast Nuevo León, México. Excavated in 1963 as part of the University of Texas' Northeast México Archaeological Project, the site contained a virtually continuous sequence of cultural material for the past 4700 years (McClurkan, 1966, 1980). During excavation, a well preserved burial (Burial 1) was recovered near the back wall of the shelter in deposits radiocarbon dated to between 1670$\pm$110 BP (Tx-206) and 2160$\pm$100 BP (Tx-208). The average corrected age of these deposits was 1747$\pm$113 BP.

Burial 1 was a flexed inhumation (McClurkan, 1966) of a young adult female approximately 18 to 35 years of age. Dental remains consist of the right maxillary central incisor and canine; the left maxillary lateral incisor, premolars and molars; and the complete mandibular dentition.

Measurements of the mutilation features were done using Helios needle-point dial calipers and recorded to the nearest 0.10 mm. The features were also examined using a binocular microscope (70x magnification) and a scanning electron microscope (LEOL T330J). For SEM study teeth were impressed in a polyvinyl siloxane compound and cast with epoxy resin. The casts then were coated with 200 Å gold palladium.

SPECIMEN DESCRIPTION

Dental mutilation was observed on the maxillary right central and left lateral incisors, which are shown in Figure 1. The right central incisor contains three notches oriented labio-lingually across the incisal margin of the