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## THE HRDLIČKA PALEOPATHOLOGY COLLECTION AT THE SAN DIEGO MUSEUM OF MAN

R. A. Tyson, San Diego Museum of Man

In 1913 Dr. Aleš Hrdlička of the United States National Museum spent three months in Peru gathering aboriginal skeletal material for the proposed Panama-California Exposition. Nearly 1,000 pathological specimens were brought to San Diego for the 1915 Exposition, with a larger collection of more normal bones remaining at the Smithsonian Institution. In order to have a wide range of disease categories, exchanges were made with the U.S. National Museum. Before the Exposition closed, the specimens became the nucleus of a Museum of Anthropology under the auspices of the San Diego Museum Association.

Besides the specimens from Peru, the collection includes material from various other locations such as Alaska, Bolivia, Mongolia and the eastern United States. The following categories are represented: osteitis, periostitis, osteomyelitis, tuberculosis, syphilis, osteoporosis, exostosis, osteophytosis, ectopic calcification, fractures, wounds, tumors, dislocations, trephinations, amputation, artificial deformation, and natural mummification.

In September 1978 the San Diego Museum of Man received a grant under a National Science Foundation program (Support for Systematic Anthropological Collections) to conserve the Hrdlička Paleopathology Collection, to catalog it, and to make the material accessible for research.

## INTERRELATIONS OF DENTAL PATHOLOGIES IN TWO ARCHEOLOGIC ESKIMO SKELETAL SAMPLES

R. L. Costa, University of Illinois

Periodontal disease and caries are two of the most clinically important oral cavity diseases in modern Western society, but have been observed only sporadically in skeletal samples dating from before the Neolithic. In order to test interrelationships between these diseases, calculus, occlusal surface wear, trauma, and age and sex, and also to eliminate the effects of modern dietary habits, two graveyard skeletal series from pre-White contact littoral Eskimo communities were studied. Dentitions of 309 individuals from Point Hope, Alaska, and 334 individuals from

Kodiak Island, Alaska were studied. As part of this project, individuals were aged and sexed, using conventional methods.

In these samples, occlusal surface wear, resorption of alveolar bone, and deterioration of the interdental septa increased with age. Bony pockets were observed too infrequently to be of epidemiologic value. Cavities became increasingly less common with age in both samples, possibly because of heavy dental attrition. Abscesses increased with age, but were only rarely caused by caries, more often by wear-related trauma or perforation of the pulp chamber. Calculus appears to have reached a maximum depth of formation and then flaked off during chewing stress.

With the absence of modern diet and the presence of heavy occlusal wear in these Eskimo: 1) caries was relatively unimportant; 2) the majority of abscesses and periapical osteitis were caused by wearing through to the pulp chamber, rather than caries; 3) alveolar resorption may have been related to heavy wear and not periodontal disease; 4) crown height of teeth was reduced by heavy occlusal wear, suggesting that teeth did not super erupt, and face height decreased with age; 5) deterioration of the interdental septa indicated that periodontal disease became more prevalent in the latter half of the third decade of life, as compared with the fourth decade in modern U.S. samples; 6) few bony pockets were observed; 7) periodontal disease was found to be somewhat related to heavy calculus deposits.

## ASYMMETRY OF THE MANDIBLE

S. L. Rogers, San Diego Museum of Man

Routine craniometric measurements commonly reveal a varying degree of asymmetry in the basic measurements of the mandible. Differences are often noted between the right and left sides with regard to the height and width of the ascending ramus, the angle of the ascending ramus and the length and depth of the mandibular body. The reasons for this lack of symmetry are commonly attributed to various aspects of dentition. In this study an effort has been made to assess the influence of several factors in dentition and of the mechanism of mastication in determining such asymmetry. Two series of aboriginal skulls, one of Anasazi Southwestern origin and the other from coastal California, have been studied in order to evaluate the role of tooth wear, tooth loss, dental pathology and other possible factors that might have a bearing on asymmetry of the mandible. The effect of asymmetry on the temporomandibular joint has also been noted.

## DENTAL WEAR AND HANDEDNESS

R. M. LaJeunesse and M. E. Thornton, California State University

The relationship between handedness, asymmetrical chewing, and dental wear was investigated. Two hundred university students, ranging in age from 17 to 50, were examined for hand preference, using Annett's questionnaire (1972), and dental wear. Correlational analysis, using Fisher's Exact Test, and conditional probabilities were computed to test these relationships. The preliminary results showed a strong positive correlation between dental wear and handedness ( $p = .001$ ). Moreover, the probability of predicting handedness from dental wear for these subjects was .96 for right-handers and .30 for left-handers. These values are a significant improvement over a priori probabilities based on the frequency of right and left handedness in the general population. The data are of value in forensic and paleodemographic problems.

## THE CORRELATION BETWEEN AURAL EXOSTOSIS AND COLD WATER SWIMMING IN ABORIGINAL POPULATIONS

E. S. D. Alcauskas, San Diego Museum of Man

Current medical evidence in the field of otology suggests that there is a significant correlation between aural exostosis and cold water swimming. This paper is an extension of that evidence into the field of paleopathology. A search was made for evidence of aural exostosis in several New World archaeological populations, which included coastal and non-coastal groups. The study resulted in a high correlation between aural exostosis and coastal sites. A further look was taken into ethnographic data concerning the specific coastal sites for evidence of extensive exploitation of the littoral and offshore environment. Again, there was a high percentage of correlation between aural exostosis, coastal sites, and exploitation of a cold water environment.

## TRACE ELEMENT ANALYSES OF TWO PREHISTORIC SOUTHWEST POPULATIONS: THE FREMONT AND THE ANASAZI

P. Stedt, San Diego State University

The Fremont and the Anasazi foraged and hunted for a wide variety of

plants and animals. Both practiced horticulture, but whereas the Anasazi became increasingly dependent upon agriculture for their dietary needs, the Fremont placed more reliance on hunting. Fifty Fremont and 50 Anasazi bone samples were analyzed for 13 elements, by inductively coupled plasma-atomic emission spectrometry (ICP-AES) to ascertain if any statistical differences existed between the two populations. The accuracy of the method was tested using NBS Phosphate Rock, Standard Reference Material (SRM) 120B. T-Tests, Descriptive Data and Correlation Matrices were done by computer analyses. There were significant differences of some elements between the populations, but the meaning is not always clear, because of the numerous variables discussed in the study.

## A CASE OF VON RECKLINGHAUSEN'S DISEASE OF BONE

M. A. Kelley, Case Western Reserve University

A severe case of osteitis fibrosa cystica (von Recklinghausen's disease of bone) was located in the Todd collection housed at the Cleveland Museum of Natural History, and was subjected to macroscopic and radiologic examination. Von Recklinghausen's disease of bone is caused by hyperparathyroidism, of which two forms are commonly recognized: primary and secondary. The primary form results from either hyperplasia or a neoplasm in one or more parathyroid glands. The secondary form most often results from chronic renal failure or decreased intestinal resorption of calcium. Hyperparathyroidism by present estimates is not that rare (one out of 834 in one study, for the primary form alone). There is no good reason to suspect that earlier populations were spared all of the disorders causing hyperparathyroidism. However, the paleopathologic reports of this disease are quite scarce. Many current researchers consider the initial, and in some cases the advanced, stages of hyperparathyroidism in the skeleton to be in actuality osteoporosis and osteomalacia. Fortunately, there is evidence to suggest that some of the early stage cases might be differentiated from osteoporosis and osteomalacia induced by other more common causes. The advanced stage lesions of hyperparathyroidism, known as osteitis fibrosa cystica (or osteitis fibrosa), display bone changes that are pathognomonic. These are: subperiosteal resorption of bone, replacement of bone with fibrous tissue, formation of bone cysts, pathological fractures, and deformities. In this form, the disease is easy to recognize and diagnose. It is suggested here that some existing cases of diagnosed osteoporosis and osteomalacia from ancient populations may, in fact, represent early stage changes resulting from hyperparathyroidism. More comprehensive radiographic surveys are called for in the future.

## TWO MUMMIES FROM HARVARD

M. R. Zimmerman, University of Michigan

The collection of mummies in storage at the Peabody Museum at Harvard was surveyed and two were selected for dissection by an international team of scientists. A Peruvian mummy was that of a young man who had suffered several wounds and fractures of the skull and face. A trephination showed little healing, indicating death shortly after the procedure. The organs were intact, but considerable insect damage limited microscopic findings to anthracosis and pulmonary fibrosis. The other mummy was an Aleut. The features of Aleut mummification were briefly discussed. The mummy was poorly preserved, showing pleural fibrosis, chronic mastoiditis and otitis media, possible healed renal tubular necrosis, and head lice. Studies are continuing on both mummies.

## THE LA BREA WOMAN

S. Shermis, California State University

Pseudopathology is a real and potent trap, especially to those with a minimal background in paleopathology. The La Brea Woman, ever since she was discovered in 1914, had been given a host of proximal causes for her death. Despite the sign in the Page Museum to the contrary, this burial dating some 9,000 years ago was a homicide. The area that received the lethal blow was the central part of the frontal and part of the left parietal. Fracture lines radiate from this anteriorly and laterally. To this extent, it very much resembles a forensic case. There were several orders of dental pathology, one a quite rare horizontal ectopic eruption of the right maxillary canine, which left only a shallow fossa in the buccal plate below the infraorbital foramen. This was diagnosed by Dr. Harry Daugherty of the U.S.C. School of Dentistry. The author believes that regardless of the sophistication of the paleopathologist, he still has to rely on the expertise of those who are in narrow fields of specialization.

## THE TELL EL-HESI EXCAVATIONS AND HUMAN SKELETAL PATHOLOGY

J. K. Eakins, Golden Gate Baptist Theological Seminary

Tell el-Hesi, the first site in Palestine to have been excavated with a real attempt at scientific methodology (1890-92, by Sir Flinders Petrie and F. J. Bliss) has been the focus of a modern interdisciplinary archaeological expedition since 1970. An old Bedouin cemetery overlies much of this mound in southwest Israel. The philosophy of the Hesi staff from the beginning has been that these graves are an important part of the tell, and deserve careful excavation and evaluation. During the past five seasons in the field, nearly 600 burials have been removed, and much has been learned about Bedouin burial customs.

Beginning with the fifth season, in 1977, an intensified effort has been made to examine the skeletal remains for evidence of pathology. Among the more common conditions thus far observed have been tooth wear and arthritis, especially vertebral osteophytosis. Other interesting findings include osteomyelitis, fractures, and congenital defects. Improvements in strategy and methodology to be employed during the sixth season of excavation, in the summer of 1979, promise to permit a more adequate and productive examination of an anticipated large number of skeletons.

#### DISEASE AND DORSAL PITTING IN THE FEMALE OS PUBIS

J. M. Suchey, California State University, D. V. Wiseley and T. T. Noguchi, Dept. of Chief Medical Examiner-Coroner, Los Angeles

Pubic bones from 486 modern American females, aged 13-99, were studied in an attempt to explore the relationship between the degree of dorsal pitting (classified as absent, trace to small, medium to large) and the following medical and surgical conditions: 1) chronic liver disease; 2) uterine fibroids; 3) hysterectomy; 4) evidence of past pelvic and/or urinary tract infection. This study was designed following the discovery that seventeen of the 486 females reported to be nulliparous had dorsal pitting graded as 'medium to large'. Six of these females had extremely large pits; of these six, three had had hysterectomies and one had uterine fibroids at the time of death. In the present study, an association at the .05 level was found (using the chi-squared test) between degree of dorsal pitting and the following: 1) hysterectomy; 2) chronic liver disease; 3) uterine fibroids. No association was found for past pelvic infection and degree of dorsal pitting. The data were then examined, giving consideration to the age factor. Older females are more likely to have had hysterectomies, or to have chronic liver disease and uterine fibroids; older females are also more likely to show pitting (Suchey, Wiseley and Noguchi 1979). In order to control for the age factor, the relationship

between these conditions and degree of dorsal pitting was examined in females in their forties and in females in their fifties. An examination of these data showed that the distribution of females with hysterectomies, chronic liver disease, and uterine fibroids was very similar to values expected if there was no statistical association between these conditions and the degree of dorsal pitting. The main purpose of this paper is to present these negative results.

## PALEOHISTOLOGICAL TECHNIQUES: A PROMISING FUTURE FOR SKELETAL ANALYSIS

D. L. Martin, University of Massachusetts

Turnover rates, ratios of resorption and deposition, and measurement of the dimension and size of various microstructural components of bone are techniques that can be successfully employed in paleopathological analysis. Diagnostic patterns, which are reflected in histologic changes in archaeological bone, include conditions such as metabolic disturbances, systemic diseases, osteoporosis, specific nutritional deficiencies, and more generalized dietary stresses. Microscopic analysis can also support and further define diagnoses of macroscopically determined pathologies such as infectious lesions and porotic hyperostosis. Paleohistologic analysis can be done through existing techniques currently used by clinical pathologists. An advantage to paleopathologists and skeletal biologists is the application of these techniques on a populational level. The significance of this type of paleopathological analysis to anthropologists is not just the delineation of disease in space and time. More importantly, paleopathological analysis on a population level will aid in the interpretations of the biological and cultural adaptation of human groups by further exploring those processes that affect it.

## HUMAN PALEOPATHOLOGY: PAST, PRESENT, AND FUTURE

M. Y. El-Najjar, New Mexico State University

This paper reviewed the early history of paleopathology studies, scanned current research, and discussed new opportunities and avenues to be explored in the future.