



Dental Anthropology Newsletter

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PRESIDENTIAL ADDRESS

The "Hard" Question

While I have the benefits of this mode of communication with a readership that shares an interest in matters pertaining to the human dentition, I thought I might use it to raise a point or two in hopes of generating a response and perhaps of stimulating some actual research efforts. One of my own main areas of interest for the past twenty-five years has been the investigation of variation in human tooth size.

Do all living people have teeth of the same size? Obviously they do not as everyone who has worked in dental anthropology is well aware. However, it has taken quite a bit of prying to come up with a systematic assessment of tooth size in modern human populations.

What can account for the differences in tooth size in modern human groups? Here the answer is less intuitively obvious than it had been for the simple question of whether significant differences in sheer tooth size could be discovered in the first place. The answer can not be sought in the immediately observable differences in life way associated with living people whose teeth differ systematically in size. Of course, an assessment of differences in living conditions is a good place to start, but it cannot lead very far because few if any people in the world today live in the same way and are subject to the same stresses as were their ancestors even a few hundred or a thousand or so years ago.

To demonstrate the circumstances that have led to the visible spectrum of tooth size differences in the world, we have had to collect evidence to document the long-term differences in subsistence strategy employed by the ancestors of those modern groups who display the maximum differences in tooth size. This is not all that hard to do, but there is a somewhat unexpected twist involved. The evidence, obviously, is archaeological, but oddly enough it is not something that the archaeologists automatically provide.

Here is a case where I would argue that, by analogy with the famous quote concerning politics, archaeology is too important to be left to the archaeologists. They do indeed dig the sites that give us the prehistoric specimens we need to ascertain the nature of human life in the past, but they rarely think in terms of how the data they uncover illustrate specific aspects of selection relating to the maintenance of human physical characteristics.

Not that I am advocating the we all rush forth and do our own archaeology. Far from it. Nor am I saying that archaeologists do not do their job well. Far from that also. The tasks of excavation are laborious and time-consuming, and the archaeological profession does them with admirable dedication and skill.

However, from our perspective as students of the human biological condition in general and its dental manifestations in particular, we have to be aware that, although archaeologists provide us with the evidence for human life in the past, they rarely tell us what it means in terms of what we need to know about the selective forces that influence the chances for human survival.

Let me give an example. Recently I prepared a manuscript summarizing the evidence for human tooth size past and present, offering an interpretation of the circumstances that led to the changes that have resulted in the modern spectrum of differences. The editors of the book for which that paper was written sent it out for review which was the right and proper thing to do. Some of the reviewers' comments were very helpful indeed, but one illustrates the point I am trying to make.

I had attributed the dental reduction in the northern areas of human occupation to the relaxation of selective pressures following the adoption of earth oven cooking techniques going back as far as the penultimate glaciation in the northwestern part of the Old World. My skeptical reviewer commented that the archaeologists of his acquaintance would almost certainly dispute that claim.

He is quite right -- they would. But this just illustrates my point. There is little or no discussion of earth ovens in the archaeological reports dealing with Middle and Upper Paleolithic sites, but just because the archaeologists are silent about the evidence does not mean that the evidence is not there. It is, and in abundance. We just have to know the details of the findings published in archaeological site reports to make our own interpretations.

Since our primary concern is with the anatomically provided food processors -- the teeth --, anything that affects their use is of great interest to us. The origin of cooking, then, is more than an item of esoteric gastronomic interest for those of us who focus on the human dentition. The evidence is available in countless archaeological site reports, but it is not collated and summarized by the archaeologists who have produced them.

The presence of fire-altered rocks in archaeological sites is duly noted in the publications because of the use of the thermoluminescence technique that provides a means of dating. Fire-altered rocks obviously demonstrate the control of fire by the prehistoric occupants of the sites in question. Further, if one checks the section profiles in the published accounts or talks to the archaeologists who did the excavating -- and they invariably provide a mine of unpublished confirmatory information -- one finds that the "hearths" duly recorded in print are vastly different from the open campfires we normally associate with that term. Those fire-cracked rocks were the heat sources for cooking that took place in pits in the ground -- earth ovens.

The archaeological data for earth oven usage are available in sporadic quantity, but we cannot rely on archaeologists to provide us with such an interpretation spontaneously. It is something we have to glean ourselves from their reports on their efforts in the field.

The regular use of cooking reduces the previously necessary amount of chewing. My own work has shown how tooth size reduces in proportion to the length of time the ancestors of a given population have used cooking and other documentable forms of food preparation. Christy Turner's work has shown that the simplification of tooth crown patterns has a similar trajectory through time -- and incidentally has been proceeding at the same rate of speed.

This brings up the "hard" question that is the title of this essay. If tooth crown complexity and sheer tooth size both undergo reductions in proportion to the antiquity of artificial food preparation techniques such as cooking, what about that other aspect of the teeth that is so intimately involved with maintaining dental function, namely tooth enamel itself?

We do know that the enamel on the teeth of living human populations is not so thick as it was in the teeth of their Middle Pleistocene ancestors, but we do not know whether this is simply proportional to the overall reduction of the teeth themselves or whether it is really a relative decrease.

Finally, there is the matter of the hardness of the enamel itself. From my appraisal of the reduction of tooth size and crown complexity in proportion to the decrease in necessary tooth usage through time, I would predict that tooth enamel has undergone a reduction in hardness proportion to the reduction in overall dental size.

Here I realize I am venturing into an area beyond the scope of my real competence, but I am encouraged by the anecdotal information provided by the clinical practitioners among our membership who regularly note that they have observed familial differences in enamel hardness by the simple test of the dental drill. While this does not produce a publishable scaled measure of hardness, it certainly does offer encouragement for a project that would assess the question of a possible spectrum of hardness between modern human populations.

Is the enamel in Australian Aborigines harder on the average than the enamel in the teeth of Anglo-Australians? I would predict that it should be, but it needs to be tested in a systematic fashion. Is the enamel in the teeth of African-Americans harder than that of European-Americans? Again, there has been no systematic investigation.

There are more than a few potential doctoral dissertations relating to the "hard" question, and I hope that this challenge produces at least one effort at an answer.

C. Loring Brace

A NOTE FROM THE EDITOR

I have combined Numbers 2 and 3 of Volume 4 for a few important reasons. First, I was fortunate enough to get an advance copy of the 1990 AAPA Meeting Program and, therefore, could include some of that information now. Furthermore, this will give you some additional time to plan for the meeting and carefully consider the important DAA elections coming up this year. Finally, since I am co-hosting the AAPA meeting with Local Arrangements Chairman M.Y. Iscan, I realized that it would be nearly impossible to produce No. 3 during what promises to be a very busy month preceding the meeting.

This will be my last year as DAN Editor, so I hope some of you will consider taking over this important position. As I mentioned before, I think that this Newsletter would be improved by the establishment of an "Editorial Board" composed of dental anthropologists with a wide range of interests. I think it is time for a dental anthropologist to take the reins and direct this Newsletter toward its potential to become a catalyst for expanded research and greater exchange of information.

The future of this organization is up to all of us, so please look over the Call for Nominations form that Chris Nicol asked me to include in this issue and think carefully about the choices that need to be made. It has been my privilege to be the Editor of the Dental Anthropology Newsletter. I have learned much and have benefited greatly from being associated with this group of intelligent and interested professionals.

Susan R. Loth

1990 AAPA AND DAA ANNUAL MEETING

By now, all AAPA members should have received their 1990 meeting packets. Unfortunately, the hotel did not include our special rates on its registration form. They are \$75.00 for a single room and \$85.00 for a double. For those of you who have not received a packet, I am reprinting the letter sent to the AAPA members:

Here in warm, sunny, South Florida, we at **Florida Atlantic University** are preparing to host the 59th annual meeting of the AAPA in Miami, FL, April 4-7, 1990. We would like to officially welcome you to our beautiful, balmy sub-tropical area. In early April, the temperature is usually in the 80s, so bring your bathing suit, sun block, and shorts if you plan to be outdoors. (However, our indoor temperatures sometimes seem to hover around the freezing point so bring some warmer clothes for meeting activities.) Besides the sandy beaches and great weather, Miami offers you a chance to experience superb multiethnic dining and an up-close look at Latin culture. In fact, although English has been declared the official state language, and is actually used in many parts of Miami, you might want to brush up on your Spanish so you can take full advantage of all that this diverse region has to offer. In the surrounding environs you will be able to find everything from alligators (preferably in the Everglades), to dolphins (at the Seaquarium and Joe Robbie Stadium), to orang-utans (at Monkey Jungle), to zebras (at Metrozoo).

The host hotel is the **Omni International** overlooking Biscayne Bay in the heart of downtown Miami. Besides the excellent meeting facilities, there is a multilevel shopping mall within the building itself, and a tram available to transport you to nearby Bayside Marketplace, with its festive shops and waterfront restaurants. The Omni is also only minutes from beaches, Metrozoo, Key Biscayne, and the Miami Seaquarium. By starting early, we negotiated very reasonable rates for a first class hotel with all the amenities during the "season." In order to take advantage of these special rates, you'll need to reserve your room before the deadline indicated on the hotel reservation card enclosed in this packet.

The annual luncheon will be held on Friday, April 6th, and will feature an address by **Dr. Kenneth M. Weiss** of Pennsylvania State University. His lecture, entitled "Odin's Ravens," will explore the role of molecular genetics in biological anthropology and its awesome potential to allow us to attack both new and traditional problems directly rather than circumstantially. Tickets will cost \$21.50. We expect this luncheon to be well attended, but there will be only a limited number of tickets available at the meeting because we must make catering arrangements with the hotel. Thus, it is vital to purchase your luncheon ticket **before** you arrive in Miami. Please complete the luncheon reservation section on the enclosed preregistration form and send it back as soon as possible. The tickets will be included in your meeting packet.

We are pleased to announce that **Delta Airlines** will be the official carrier for this meeting. Reservations can be made through the AAPA's designated travel agency:

Rhodes Travel

P.O. Box 5267

702 North Midvale Boulevard

Madison, WI 53705

Telephone: 1-800-877-9494 (USA) and 1-800-362-0377 (WI)

Rhodes has promised to find the lowest rates to Miami. Through an arrangement with Delta, they can offer 40% off of their published coach fare and 5% off of the lowest special fare available. Therefore, we suggest that you use the toll free numbers listed above to make your reservations. If you can only call at night or on Sunday, you may also book directly with Delta using the AAPA meeting I.D. code J0821. However, we strongly encourage you to use Rhodes Travel because a portion of the total sales will be contributed to the AAPA. Rhodes will also be handling car rentals and can offer discounted rates starting from \$79.00 per week (with unlimited mileage) from Avis. Not only is this an excellent price, but these proceeds will also benefit our organization.

When you arrive at the Miami International Airport, use the coupon in your packet to get a \$5.00 ride on the "**SuperShuttle**" to the Omni Hotel, about 15 a minute drive. After retrieving your luggage, you can find a convenient SuperShuttle Station at the Van/Limo booth at curbside or call 871-8488 at the airport. To make reservations to return to the airport, call SuperShuttle at 871-2000 from your hotel.

We have also made arrangements with **All Florida Adventure Tours** to offer special rates to AAPA members and their families on a number of sight seeing tours and excursions to several attractions in and around Miami, the Bahamas, the Florida Keys, and Disney World. Please use the enclosed brochure to make your reservations in advance.

We would like to remind those of you who have not yet registered for the meeting to please preregister. As you know from past meetings, it takes much longer to go through the process of having to wait for your name tag and information packet to be made up on the spot. Furthermore, as we mentioned earlier, there may not many luncheon tickets left if you wait until the last minute.

Some final warnings, you may find it very uncomfortable to sit through the sessions with a sunburn, so don't try to get all of your sunbathing in on the first day and, when you do go out, don't forget the sun block.

If you wish to contact me, the most efficient way to do it is through electronic mail. My BITNET node is ISCANMY@SERVAX.

We look forward to seeing you in Miami.

M. Yasar Iscan, Ph.D.
Local Arrangements Chairman

1990 DENTAL ANTHROPOLOGY SESSIONS AND SYMPOSIA

As usual, the DAA meeting and symposia will be held in conjunction with the American Association of Physical Anthropologists (AAPA) meeting. Fortunately, I received an advance copy of the program and can include the schedule of dental anthropology papers.

DENTAL AND CRANIOFACIAL BIOLOGY

Session 16

Chair: J.R. Lukacs

Friday Morning - April 6th

- 8:00 Diagenetic changes in bones and teeth evaluated by backscattered electron imaging. L.S. Bell, University College London, England.
- 8:15 Dental and body reduction in Sudan from Mesolithic to Christian period. A. Coppa, R. Vargiu, Universita La Sapienza, Italy, and G.J. Armelagos, University of Florida.
- 8:30 Maxillary anterior attrition and molar lingual root polish from the Florida Early Archaic. D.N. Dickel, Past-Tense Archaeology, Gainesville.
- 8:45 A comparison of pre- and postnatal growth of the human skull. H.M. Grausz, Johns Hopkins University School of Medicine.
- 9:00 A paleo-indian mandible from Warm Mineral Springs, Florida. A.M. Haeussler, D.H. Morris, and C.F. Merbs, Arizona State University.
- 9:15 Heritability of craniometric and occlusal variables: A longitudinal sib analysis. E.F. Harris, University of Tennessee.
- 9:30 Correlations among growth rates in the craniofacial complex. L.A.P. Kohn, Washington University, and C.F.A. Moorrees, Harvard University.
- 9:45 A longitudinal study of the human nasal bone: Elliptical Fourier descriptors. P.E. Lestrel, C. Engstrom, UCLA, and A. Bodt, Kaiser Permanente.
- 10:00 INTERMISSION
- 10:15 Agricultural intensification and dental pathology at Mehrgarb, Pakistan. J.R. Lukacs, and L.L. Minderman, University of Oregon.

- 10:30 Genetic and environmental characteristics as seen in dental anthropological materials. F. Miura, K. Soma, T. Kuroki, Tokyo Medical and Dental University, Japan, and T. Aoba, Loyola University of Chicago.
- 10:45 Path modeling in the analysis of the inheritance of tooth crown dimensions. C.R. Nicol, Arizona State University.
- 11:00 Morphological changes preceding the advent of food production. L.A. Schepartz, Moorhead State University, and S.A. Brandt, University of Florida.
- 11:15 An archaeological application of cemental annulation at Tipu, Belize. L.E. Wright University of Chicago.
- 11:30 Occlusofacial form commonality at two developmental levels. M.R. Zingesser, OHSU, Portland.
- 11:00 DISCUSSION

PALEOANTHROPOLOGY 3: HOMO

Session 19

Chair: B.H. Smith

Friday Afternoon - April 6th

- 1:00 *Homo habilis*: the sexual dimorphism hypothesis considered. J.A. Miller, USC School of Medicine.
- 1:15 Evolution of the hominid vertebral canal. C.G. Childress, Ohio Northern University.
- 1:30 Narmada Man fossil skull from India: dating, morphology, taxonomy. K.A.R. Kennedy, Cornell University.
- 1:45 The ancestry of modern Australasians: evidence from the Early Pleistocene. A. Kramer, University of Michigan.
- 2:00 KNM-WT 15000 and the life history of *Homo erectus*. B.H. Smith, University of Michigan.
- 2:15 The Zuttiyeh face, a view from the east. S. Sohn and M.H. Wolpoff, University of Michigan.
- 2:30 The taxonomic dilemma of the Tangier Maxilla: a metric and nonmetric assessment. S.M.T. Myser and F.H. Smith, University of Tennessee.
- 2:45 The Kebara hyoid: What can it tell us about the evolution of the hominid vocal tract? J.T. Laitman, J.S. Reidenberg, P.J. Gannon, B. Johansson, Mount Sinai School of Medicine, K. Landahl, University of Chicago, and P. Lieberman, Brown University.
- 3:00 Functional adaptations in corpus morphology of neandertal mandibles. B. Demes, E. Tepe, and H. Preuschoft. Ruhr-Universitat, FRG.
- 3:15 DISCUSSION
- 5:30 DAA BUSINESS MEETING (Following the second half of the above session.)

Many other contributed papers and posters dealing with dental anthropology are also being presented within the contexts of a number of other sessions and are listed in the program.

COMMENTS AND CORRESPONDENCE

As Alan Goodman mentioned in the last issue of DAN, there are new NIDR funding potentials in the areas of nutrition and oral health. These have been published, at least in part, in the October 27, 1989 NIH Reports (vol 18, No 38, page 5). Of particular note are examples of "Effect of 9:00malnutrition on abnormal tooth development..." and "Effects of fluoride in nutritionally compromised individuals".

In the last DAN, Alan also gave an excellent report on the New Zealand conference on developmental defects of enamel. He wants to inform you that the proceedings have been published as *Advances in Dental Research* (Sept, 1989, vol 3, no 2).

Two edited books with a number of chapters of interest to our membership have been published by DAA founder and former president M. Yasar Iscan. *Age Markers in the Human Skeleton*

came out in December '89 and offers a comprehensive analysis and critique of the state of the art approach to age estimation throughout the skeleton. This truly international book includes an entire section on the analysis of dentition featuring the following chapters: "Age changes in teeth: Developmental and regressive" by G. Bang; "Assessment of age from the dentition in children" by A. El-Nofely and M.Y. Iscan; "Age determination from teeth in the adult" by J. Kilian and E. Vlcek; "Estimating age at death from growth layer groups in cementum" by D.K. Charles, K. Condon, J.M. Cheverud, and J.E. Buikstra; and "The relationship of tooth wear to aging" by D.R. Brothwell.

Not content to merely complete one book at a time Yasar also finished *Reconstruction of Life from the Skeleton* edited with Ken Kennedy. This edition came out in November '89 and covers every aspect of skeletal assessment including a chapter by J. Lukacs on "Dental paleopathology: Methods for reconstructing dietary patterns."

If you are wondering what your DAA Editor has been up to, you might want to read "Morphological assessment of age in the adult: The thoracic region" by S.R. Loth and M.Y. Iscan in the Iscan book, and "Osteological Manifestations of Age in Adults" by Iscan and Loth in the Iscan and Kennedy edition.

DAA BUSINESS

The 1990 DAA business meeting will be held on Friday evening from 5:30 to 6:30 in the Serena Room at the Omni in Miami. We will be electing a new President, Secretary/Treasurer, member of the Executive Board and appointing a new Editor. Hopefully, an Editorial Board will also be established at this time.

Nominations and Election Committee Chairman Chris Nichol has informed me that he has not as yet received any suggestions for nominees from the membership. Our future depends on it! So, please think about whom you might like to see in these positions and send your suggestions to Chris. Either call him or fill out and submit the following form:

1990 CALL FOR NOMINATIONS

For President: _____

Sec'y/Treasurer: _____

Exec. Board Member: _____

DAN Editor: _____

Send to: Christian R. Nichol (Phone: 716-691-4549)
66 Grandview Dr. - Left Side
N. Tonawanda, NY 14120

THE EXECUTIVE BOARD

We encourage the membership to contribute not only to DAN, but also to contact the appropriate Executive Board member with any suggestions or questions you might have. They can be reached as follows:

President - C. Loring Brace, Ph.D.
Museum of Anthropology
University of Michigan, Ann Arbor, MI 48109
Tel. (313) 764-0485
TELENET Node: C. LORING BRACE@UM.CC.UMICH.EDU

Secretary/Treasurer - B. Holly Smith, Ph.D.
Museum of Anthropology,
University of Michigan, Ann Arbor, MI 48109
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Tel. (604) 291-3135

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1989 MEMBERSHIP DUES

The 1989 dues should be submitted now if you haven't already done so. Rates will remain at \$10.00 for regular members and \$5.00 for students. Also, we would like to continue our policy of sponsoring foreign members. Our Secretary/Treasurer, Holly Smith, suggests that even a partial contribution will be appreciated since even \$5 or \$10 is a great hardship in some parts of the world. We salute those of you have generously given financial support in the past and encourage every member who can to do so. There is a sponsorship section on the membership form on the next page, please fill it out and return it with your own dues. Finally, I'd like to remind you that checks should be made out to the DAA and be sent to Holly Smith at the address listed on the renewal form.

DENTAL ANTHROPOLOGICAL ASSOCIATION
MEMBERSHIP APPLICATION OR 1989 RENEWAL

Membership is for the calendar year and includes a one year subscription to the Dental Anthropology Newsletter (3 issues). Dues are \$10.00 for regular members and \$5.00 for students. Make your check payable to the "Dental Anthropological Association" and mail to:

B. Holly Smith, Ph.D.
DAA Secretary/Treasurer
Museum of Anthropology
University of Michigan, Ann Arbor, MI 48109

The DAA has a limited number of sponsored memberships available for foreign members. If you are requesting sponsorship, send a letter of inquiry to Dr. Smith at the above address.

NAME: _____

ADDRESS: _____

TELEPHONE: _____ BITNET NODE: _____

SPECIALTY: _____

\$ _____ Amount enclosed

_____ Please check if you are a new member

_____ Please check if this is a change of address

_____ Please check if contribution to new member
is included (see below)

If you wish to contribute toward sponsorship (in any amount) please specify below and indicate if you have a specific individual in mind.

I wish to contribute toward the sponsorship of

and have enclosed \$ _____.