SAS
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NEWSLETTER
SOCIETY FOR ARCHAEOLOGICAL SCIENCES

Archaeological Research Unit, Radiocarbon Laboratory, Department of Anthropology
University of California, Riverside — Riverside, California 92512

CURRENT RESEARCH

Amino Acid Racemization Research: New Directions and Applications

The success of the amino acid racemization technique in dating fossil bone has brought racemization research into prominence as a valuable chronometric tool in the study of human evolution and culture histories.

Jeffrey Bada (Scripps Institute of Oceanography, Institute of Marine Resources and Department of Biology, University of California, San Diego) has been a major figure in the research and development of the technique in its application to studies in paleoanthropolgy. Amino acid racemization refers to the chemical process which occurs in the bone collagen whereby L amino acids change into the corresponding D amino acids. As the D/L amino acid ratio increases with age, the proportion of D to L amino acids in fossil bones can be used in the calculation of the age of the sample. This is a very important dating tool in the study of early man because only small amounts are needed for analysis, the datable range is extended beyond radiocarbon methods, and the fossil bones may be dated directly.

Although the major thrust of the interdisciplinary research program at Scripps continues to be amino acid racemization dating of fossil bones from diverse sites around the world, Bada sees the racemization technique moving in new and innovative directions in its application and use. He describes three areas of focus for racemization research at Scripps. The primary focus continues to be on research into racemization dating of fossil bones. Along these lines, Bada has cooperated with two other racemization laboratories in a study comparing the results of independent analyses of 25 fossil bones. The results, soon to be published in *Earth and Planetary Science Letters*, showed that for aspartic acid, the most widely used of the stable amino acids, the racemization results were highly reproducible regardless of the technique used in analysis. He also is engaged in deriving equations for the decomposition processes for other amino acids. In this way the two variables, time (age) and temperature, can be derived without calibration with radiocarbon dated material. Further contributions to paleoanthropology can be expected from his laboratory. This summer Bada will be working on important fossil bones in China, especially the finds from Choukoutien.

The second focus centers on the study of racemization in very long-lived mammals. By studying the aspartic acid racemization in tooth enamel he predicts that small amounts of racemization should occur in the stable proteins which are not regenerated during the life of these mammals. Thus amino acid racemization may become a biochronometric tool in historical archaeological contexts.

The third focus of racemization research at Scripps is on further investigation of organic chemical compounds in the ocean. As little is known of the chemical processes occurring in the ocean, this research continues to make significant contributions to marine research.

Bada expresses concern in the area of interdisciplinary collaboration between archaeologists and the other specialists in his field. He feels that much of the frustration felt between archaeologists and specialists in other fields can be removed by striving to make archaeologists more cognizant of the factors involved in arriving at reliable results. In this way he feels the archaeologist will be capable of evaluating, for example, a date for a sample on the basis of how the analyses were performed.

Reported by P.I. van der Hoeven

NEWS OF THE SOCIETY

LETTER TO SAS MEMBERS

During the two years since its founding, the SAS has grown from a nucleus of 100 to over 600 members, thanks largely to the enthusiasm of Erv Taylor. The charter of the Society identifies its members as involved in physical and natural science applications to archaeology and paleoanthropology. We are obviously a diverse group, and I believe that we need to develop and strengthen our sense of identity.

Since the 1978 and 1979 business meetings were held in conjunction with the Society for American Archaeology, only some of us have had an opportunity to interact as a group. An information form is included, to give you an opportunity to tell your executive board where you think the SAS should be heading and how you think this can best be accomplished. Please fill in the form promptly and send it to me. Then I can report on your input in the last SAS *Newsletter* of 1979, identifying the different fields of specialization and summarizing the major categories of suggestions.

The SAS *Newsletter* is our primary means of communication, so your suggestions as to format and contents will continue to be welcome and useful.

Another potential but underexploited means of communication is the *Journal of Archaeological Science*. The *Journal* needs some discussion, from several angles.

(a) The *Journal* can serve as a convenient forum for research results and ideas among our diversified membership. As editor, I would also like to see more than specialized, technical papers of the sort that are standard fare in *Archaeometry*. Without intending to denigrate such basic papers, we also need interdisciplinary contributions, guest editorials, and other papers that will help stimulate dialog between "digging" archeologists on the one hand, and specialists from the earth, biological and physical sciences on the other. With such papers the *Journal* could promote more effective interdisciplinary collaboration in all phases of archaeological work. At the same time, a beefed up *Journal* could help crystallize a new subfield of archaeological science.

(b) The facts on the *Journal* are disappointing, editorially. In the 18 months I have been North American editor, the manuscripts received were mainly mediocre and commonly overspecialized: e.g. a battery of tests applied to a single artifact of no particular contextual interest; a process description of only nominal interest to archaeology; or a straight archaeology paper already rejected by *American Antiquity*. The *Journal* shouldn't become a repository for trivia or third-rate papers. But until more and better papers come in, my British co-editors will have to continue emphasizing technical reports. Read this as an open invitation for that "idea piece" you've always wanted to do, or for that innovative report you've been thinking about trying! And note: Publication time is averaging only 10 months.

(c) At the moment there are about 250 subscriptions in North America, about 75% of them institutional. Checking the 1978 list, there even are some conspicuous gaps in standing library orders: U. of California at Riverside and Santa Cruz; the universities of Utah, Nevada, Colorado, Wyoming, New Mexico and Calgary; U. of Minnesota at Duluth; U. of Wisconsin at Madison and Milwaukee; Southern Illinois U.; Michigan State, Case Western and Kent State; McGill; Laval; Dalhousie; U. Maine; Boston U.; U. of Massachusetts at Amherst; George Washington and

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EDITOR: S.P. De Atley
ASSOCIATE EDITORS: P.I. van der Hoeven, Matthew Hall

American U. At the very least, SAS members should be able to talk their institutional libraries into subscribing to the *Journal!*

(d) Hopefully the number of personal subscriptions can also be increased. After prolonged negotiation, Academic Press (New York) agreed to a one-third reduction for personal subscriptions (initially down to $20). Because of continuing limited circulation, the London office then increased the base rate, resulting in a final figure of $27 — still a bargain for a journal of its kind and quality.

(e) *It is possible that Academic Press (London) might consider letting the Journal serve as mouthpiece for the SAS, incorporating the Newsletter. If assured a dramatic increase in subscription through membership enrollment, total price could be kept at or under $25.* On the attached form, please indicate whether you would seriously consider such an option. Any opinions on the matter are welcome. My personal view is that the financial burden would be compensated by the opportunity of getting an effective, first-rate journal going. One that would report on the kinds of research and ideas that the great majority of us would like to see and talk about.

Please let me have your reactions as soon as you can.

—Karl W. Butzer, President

NEWS OF THE PROFESSION

RESEARCH ASSOCIATESHIPS

The Center for Archaeological Research and Development (CARD), Peabody Museum of Archaeology and Ethnology, Harvard University, offers for the first time two Research Associateships to researchers interested in pursuing research or developmental projects related to the Peabody Museum collections and the use of the CARD facilities. The newly established CARD facilities include a radio carbon dating laboratory, a thermoluminescence dating laboratory, x-ray diffraction and flourescence laboratory, a full microscopy and sample preparation laboratory, a photography laboratory, a biological laboratory and remote sensing equipment. The term of the Associateships will be for a period of three summer months beginning June 1, 1980. These Associateships are reserved for researchers who have had prior experience in conducting instrumental analysis on aracheological or ethnographic collections. Preference will be given to the applicants who, in the opinion of the Awards Committee, will profit most from utilizing the resources and facilities of the Peabody Museum.

Application for the Associateships beginning Summer 1980 must be made by letter to: Dr. J.E. Ericson, CARD, Peabody Museum, Harvard University, 11 Divinity Avenue, Cambridge, MA 02138,mber 15, 1979. Further information on the Center can be sought by requesting the CARD Handbook. Every applicant for an Associateship offered by the Museum must submit a typed application which includes:

- —name, home address, telephone number
- —affiliation, address, title, telephone number
- —cirriculum vitae
- —three letters of recommendation sent directly to the above address
- —a detailed description (not to exceed 3,000 words) of project proposed by the applicant, including the following:
  - —an abstract (not to exceed 300 words)
  - —an introduction, discussing significance of project
  - —a detailed research design of project including collections or samples to be analyzed or examined, instrumentation and facilities to be used.
  - —a specific schedule of research
  - —a statement of potential funding arrangements

Announcement of the awards will be made on February 15, 1980.

AMERICAN ARCHAEOLOGY REPORT SERIES

The *American Archaeology Reports* series has recently been initiated at the University of Missouri-Columbia, and has received a very good response from the profession all across the country. It is a publication in microfiche of cultural resource management studies, theses, dissertations, symposia and special analyses. Publications in the series are not limited to Missouri, and the Editor is soliciting appropriate manuscripts on a wide number of topics and geographic areas.

The "symposia" and "special analyses" aspects of the series may be of particular interest to SAS members. The skyrocketing costs of hard copy publication, and the months or even years of delay entailed can only handicap researchers in fields that are rapidly progressing. The only requirements for publication in the *Reports* series is that the work be of high professional quality and that it be submitted in camera-ready format. Once the manuscript has been reviewed and accepted, it can be published and made available within a very few weeks. The reproduction quality is directly related to the quality of the original. Photographs (especially halftones), graphics, and tabular material can all be reproduced nicely, as can computer printouts. Since every University library and most public libraries have fiche readers, access to the data is no problem. The cost is also very reasonable; the average price is around $2 or $3.

This format can be particularly valuable in the field, since all the site records and reports or manuscripts for an entire region can be taken into a field situation in a two inch fiche binder. With an optional converter to run the fiche reader off a cigarette lighter, portability poses no problems.

Further information on the series and a current publication list may be obtained from the Editor, *American Archaeology Reports*, 15 Switzler Hall, University of Missouri-Columbia, Columbia MO. 65201.

Submitted by David J. Ives, Archaeology Survey, University of Missouri-Columbia, Columbia, MO 65201.

ARCHAEOMETRIC CLEARING HOUSE

Since its inception in 1975, the "Archaeometric Clearinghouse" in the *Journal of Field Archaeology* has attempted to initiate and improve mutually beneficial collaboration between field archaeologists and archaeometrists. It seems to be a useful resource for SAS members. Most of the issues have provided registers or directories of commercial firms and members of academic and research institutions, along with descriptions of their work and interests. The first issue presented North American specialists. Subsequent issues have included a report on the Directory of Commercial Testing Laboratories put out by the American Society for Testing and Materials; the PACT directory of European research establishments and laboratories which constitutes a European Archaeometric Clearinghouse; and an international list of ICAZ archaeozoologists and their specialties. The most recent contribution has changed focus: it includes appeals from directors of two archaeological projects for a variety of technical and scientific experts. They include descriptions of the projects and specifics on the type of collaboration being sought. Communications regarding the "Clearinghouse" should be sent to Professor Curt W. Beck, Dept. of Chemistry, Vassar College, Poughkeepsie, N.Y. 12601.

RESEARCH NOTES

Lithic Analyses

Ervan G. Garrison (University of Missouri-Columbia) is investigating the electron spin resonance of cherts.

David J. Ives (University of Missouri-Columbia) is involved in trace element analysis of chert from prehistoric quarrying areas across the country.

SAS INFORMATION FORM

NAME

DEPARTMENTAL & INSTITUTIONAL AFFILIATION:

YOUR PHYSICAL/NATURAL SCIENCE SPECIALITY APPLIED TO ARCHAEOLOGY: (be general, not specific)

WOULD YOU BE WILLING TO PAY $25 FOR THE JOURNAL OF ARCHAEOLOGICAL SCIENCE PLUS THE SAS NEWSLETTER?

(circle) yes no

WHAT PRIMARY GOALS SHOULD THE SAS AIM TO SERVE:

WHICH ANNUAL MEETINGS SHOULD THE SAS LINK UP WITH?

CURRENT PLANS ARE TO HAVE THE FIRST SCIENTIFIC SESSION IN CONJUNCTION WITH THE PHILADELPHIA SAA MEETING. WOULD YOU ATTEND?

(circle) yes no

THE SAS BOARD IS INVESTIGATING PUBLISHING ABSTRACTS IN ARCHAEOMETRY AND ARCHAEOLOGICAL SCIENCE. DO YOU FEEL THE NEED FOR SUCH A PUBLICATION?

(circle) yes no

IF NO, WHY?

IF SO, WOULD YOU BE WILLING TO SPEND UP TO $10 FOR AN ANNUAL PUBLICATION WITH REASONABLY COMPLETE COVERAGE?

(circle) yes no

GENERAL SUGGESTION FOR FORMAT/CONTENT OF THE SAS NEWSLETTER:

GENERAL SUGGESTION FOR CONTENT/EDITORIAL DIRECTION OF THE JOURNAL OF ARCHAEOLOGICAL SCIENCE:

(Fold and staple)

From:

Stamp

Here

To:

Karl W. Butzer
The University of Chicago
5828 S. University Ave.
CHICAGO, IL 60637

Other suggestions:

Ceramic Analyses

Ann Tippett (University of Missouri-Columbia) is doing neutron activation analysis on prehistoric ceramics from southwest Missouri.

Faunal Analyses

Richard Meadows (Harvard University) has completed his thesis on the possible independent domestication of cows in eastern Iran and Pakistan, using faunal analysis.

MEETING NOTES

1980 SYMPOSIUM ON ARCHAEOMETRY

The Groupe des Methodes Physiques et Chimiques de l'Archeologie will hold an Archaeometry Symposium in Paris at the Ecole Normal Superieure, 26-29 March 1980. General topics will include Physical and chemical analysis, Dating methods, Mettalurgy, Numerical data analysis, and allied techniques. Theme sessions are planned for Dendrochronology, Dating in the 40,000 to 100,000 B.P. range, Definition and survey of the limits of archaeological sites, and Determination of provenance of ceramics.

Those wishing to present papers should submit a short abstract before 15 December 1979 to the Symposium Secretary, C.R.G. Garchy, 58150 POUILLY SUR LOIRE, FRANCE. The following information should be included: (i) author's names and addresses, underlining the speaker's name; (ii) title of the paper; (iii) maximum and minimum speaking times; (iv) whether they wish to have the paper published. (It will be possible to publish papers presented at the Symposium in numers 4 and 5 of the *Revue d'Archeometrie*.)

The program will be finalized on 10 January 1980. Since a positive attempt will be made to reduce the number of parallel sessions, it may be necessary to restrict the speaking time to 15 minutes per paper (except possibly for those papers included in the theme sessions) and to limit each participant to one paper. If the number of papers exceeds the available speaking time, a system of refereeing will be introduced.

Registration forms and programs will be available in early January, and will be sent to people who have attended the last two symposia (Bonn 1978, London 1979). Others may obtain them on request from the Symposium Secretary. Early registration is advised, as it may be necessary to limit numbers. The registration fee will be around FF 200.

REPORT ON GEOARCHAEOLOGY SYMPOSIUM HELD IN VANCOUVER

A symposium on Geoarchaeology was held at the 44th Annual Meeting of the Society for American Archaeology, Vancouver, April 25, 1979. The symposium was organized by Fekri A. Hassan (Washington State). Lambert Dolphin (SRI International) contributed a paper on Geophysical prospecting in archaeology with an emphasis on his recent work on locating missing tombs and hidden rooms in the Pyramids of Giza, Egypt. John Kraft (Deleware) presented examples of his work on the geoarchaeology of coastal sties from Delaware and Greece. Bruce Gladfelter (Illinois, Chicago Circle) examined the Mississippi floodplain setting of Archaic, Woodland, and Mississippian sites in the vicinity of E. St. Louis. Robert Folk (Texas, Houston) discussed the geological setting of Tell Yinam, Galilee, Israel and provided evidence for the earliest mikveh yet found. Jack Donahue and James Adovasio (Pittsburgh) reviewed the results of their work on the geology of Meadowkroft rockshelter. Rates of deposition and the paleotopography of successive living floors were emphasized. John A. Gifford and George R. Rapp, Jr. (Minnesota) presented the results of an analysis of samples collected in 1937 from Troy. Sediment, pollen, and phytolith analyses were carried out. Fekri A. Hassan (Washington State) discussed the potential contributions of geoarchaeology to subsistence and settlement studies. Karl W. Butzer (Chicago) discussed the scope of geoarchaeology, emphasizing the role of geoarchaeology in modeling subsistence-settlement systems and argued for central role of geoarchaeology within the contextual paradigm of archaeology. This theme was discussed by Michael B. Schiffer (Arizona), the participants, and the audience following the presentation of the papers. It became obvious from the discussion that geoarchaeology must assume its role in contributing to the issues of contemporary archaeology. Site forming processes and man-land relationships were two areas that were particularly emphasized. Multidisciplinary training of students and collaboration between earth scientists and archaeologists through all stages of

archaeological investigation from research design to the final stage of publication were believed to be essential for more effective geoarchaeological research.

RECENT PUBLICATIONS

GENERAL

Hassan, Fekri A. 1979 Geoarchaeology: The Geologist and Archaeology. *American Antiquity* 44 (2):267-270

Carter, Giles F., Ed. 1978 *Archaeological Chemistry II: Papers from a Symposium, August 1977.* American Chemical Society, Washington D.C. Advances in Chemistry Series, 171.

Art and Technology Technical Abstracts. Published semiannually at the Institute of Fine Arts, New York University, for the Institute for Conservation of Historic and Artistic Works, London. Inquiries to Circulation Dept., AATA, c/o New York University, Conservation Center, Institute of Fine Arts, 1 E 78th St., N.Y., N.Y. 10021. Categories divided by substance described or by method and techniques, including microscopy, radiography, chemical and other types of analysis.

REMOTE SENSING

Weymouth, John W. and Robert Nickel 1977 A Magnetometer Survey of the Knife Indian River Villages. *Plains Anthropologist* Memoir 13:104-118.

ENVIRONMENT

Van Devender, Thomas R. and W. Geoffry Spaulding 1979 Development of Vegetation and Climate in the Southwestern United States. *Science* 204:701-710.

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