

***From RADIOCARBON***

*In Association with the American School of Prehistoric  
Research, Peabody Museum, Harvard University*

**Late Quaternary Chronology and  
Paleoclimates of the Eastern  
Mediterranean**

Edited by OFER BAR-YOSEF and RENEE S. KRA

This sourcebook results from a workshop convened by the editors at the 14th International Radiocarbon Conference, 24 May 1991, in Tucson, Arizona. *Late Quaternary Chronology and Paleoclimates of the Eastern Mediterranean* brings together the results of varied radiometric dating techniques into one convenient reference. The volume includes: 1) discussions of TL, ESR and U/Th dating relevant to the hotly debated issues of the origins of modern humans and the fate of the eastern Mediterranean Neanderthals; 2) comprehensive compilations of radiocarbon dates encompassing the past 40,000 years, with special reference to the shift from foraging to agriculture and animal domestication, as well as critical re-evaluations of the available dates; 3) summaries of the paleoclimates of the area during the last 20,000 years as viewed through marine, continental, palynological and paleohydrological sequences. This 377-page book contains 23 articles by international scholars well-known in their respective fields.

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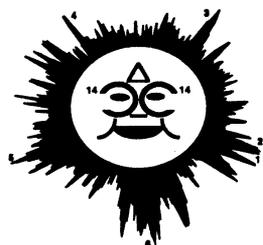
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Edited by Minze Stuiver, Austin Long and Renee S. Kra

**CALIBRATION 1993** amends and extends the time series published in the 1986 Calibration Issue. This special hardcover edition contains tree-ring-derived calibration curves for the radiocarbon time scale, a marine calibration curve employing U/Th coral data, and discussions of atmospheric and marine reservoir influences on measured  $^{14}\text{C}$  ages. Calibration procedures are also reviewed.

A 5¼" diskette of the new IBM-PC based program, CALIB 3.0.3C (M. Stuiver and P. Reimer, University of Washington), is included. The program integrates the new atmospheric and marine data presented in this issue, and allows for calibrations from "conventional radiocarbon years" to calendar dates for the past 18,360  $^{14}\text{C}$  years.

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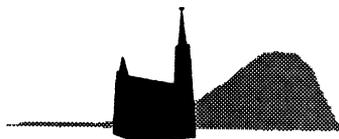
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# LSC 92



VIENNA, AUSTRIA  
14–18 September 1992

*From* **RADIOCARBON**  
*An International Journal of Cosmogenic Isotope Research*

## LIQUID SCINTILLATION SPECTROMETRY 1992

*Edited by* JOHN E. NOAKES,  
FRANZ SCHÖNHOFER and HENRY A. POLACH

*Liquid Scintillation Spectrometry 1992* contains papers presented at an international conference, "Advances in Liquid Scintillation Spectrometry", held in Vienna, Austria, 14–18 September 1992. The volume reports state-of-the-art research and technology in the field of liquid scintillation counting. The Methods section contains sample preparation and measurement techniques, scintillators and solvents, alpha measurements and standardization. The Bioscience Applications section is an overview of liquid scintillation spectrometry in molecular biology and implications of epidemiological studies. Environmental Applications include the use of tritium, radon, radium, uranium and other radionuclides in studies of radiation protection, tracer techniques and waste management. The editors are leading scientists from the USA, Austria and Australia, and the authors are international academic scholars and industrial researchers. The 512-page hardcover volume contains extensive bibliographical references and a comprehensive index. It was published in October 1993 by *RADIOCARBON*.

ISBN 0-9638314-0-2

### LSC 94 – PROCEEDINGS OF THE INTERNATIONAL CONFERENCE GLASGOW, SCOTLAND 8–12 AUGUST 1994

*Liquid Scintillation Spectrometry 1994* continues the series of conference proceedings, most recently from Glasgow. Themes include: New Instrumentation, Advances in Liquid and Solid Scintillators, Bioscience Applications, Environmental Applications, Alpha Counting, Cerenkov Counting, Data Handling Algorithms/Computer Applications and Software, and Sample Handling and Disposal, among others. This volume contains peer-reviewed articles covering a wide range of liquid scintillation topics. It will be available in Fall 1995.

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## 7th International Conference on Accelerator Mass Spectrometry

Tucson, Arizona  
May 20–24, 1996

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### Conference Address:

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NSF Arizona AMS Facility  
Physics Building  
The University of Arizona  
Tucson, Arizona 85721 USA  
Tel.: (520) 621-6810  
Fax: (520) 621-9619

### SECOND CIRCULAR – MAY 1995

**THE SEVENTH INTERNATIONAL CONFERENCE ON ACCELERATOR MASS SPECTROMETRY** will take place May 20 through May 24, 1996 in Tucson, Arizona. We expect about 150 participants, based on returns of the first circular. There will now be four associated workshops. Two specialized pre-conference workshops will be organized by Lawrence Livermore National Laboratory, and will focus on  **$^{129}\text{I}$  studies of AMS (May 16, 1996)** and **Biomedical  $^{14}\text{C}$  Applications (May 17, 1996)**. A larger pre-conference workshop will take place on **May 18, 1996** at Scripps Institution of Oceanography in La Jolla, California and will focus on **Applications of AMS to Global Change**. We expect up to 75 people at the La Jolla workshop. The times of the workshops will not overlap, so it will be possible to travel from Livermore to San Diego to participate in the Global Change workshop. A post-conference workshop will be held in Tucson (May 25, 1996) on **Geological Applications of AMS**. Descriptions of the workshops are enclosed. There will also be a post-conference field trip. The **THIRD CIRCULAR** containing detailed conference and workshop information will be mailed in October 1995.

The AMS-7 conference will be at the **Westward Look Resort**, 245 East Ina Road, Tucson, AZ 85704, located in the foothills of the Santa Catalina Mountains. The conference rate for the rooms is expected to be \$106.50 including tax per room. Rooms are equipped with refrigerators and other amenities. The hotel has several pools, tennis courts, two restaurants, a lounge bar and other facilities. Details about hotel reservations and transportation will be sent with the **THIRD CIRCULAR**.

**Evening and social activities** start with a traditional **Mexican reception** on Monday evening. Wednesday is the day to relax, with an optional half-day Conference Outing to the Arizona-Sonora Desert Museum and San Xavier Mission on Wednesday morning. Wednesday afternoon is free for you to relax by the pool, go shopping, explore the surrounding area, or meet with colleagues. The banquet on Wednesday evening will feature regional fare. On **Thursday**, afternoon sessions will be held on the University of Arizona campus. We invite conference participants to **tour our laborato-**

ries on the University campus after sessions end on Thursday evening, after which we hope to have a small reception.

**Registration information** will be sent with the THIRD CIRCULAR. The registration fee will be \$285.00 before February 1, 1996, and \$325.00 after this date. **Conference Proceedings** will be published by Nuclear Instruments and Methods, Section B. Authors should bring their manuscripts to the meeting. Conference abstracts will be published by Radiocarbon. The conference abstracts and proceedings will be provided free to all registered attendees. The registration fee includes the conference volume, the opening reception on Monday evening, continental breakfasts and coffee-breaks, the banquet and to the UA campus on Thursday, laboratory tour and reception.

**Travel information for participants in the pre-conference workshops.** Sufficient travel time is allowed between the various pre-conference workshops and the main conference to all participants to travel from one location to the other. We will provide complete detailed travel information in the THIRD CIRCULAR, to be sent in October 1995. A FINAL CIRCULAR including Conference Program will be sent to registered participants in April 1996.

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### ABSTRACTS

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Abstracts should be typed using 10 or 12 point font, to fit onto one page of letter-sized or A4 paper. Allow 2.5 cm for margins on either side. Please also provide an electronic version of your abstract either as an ASCII text file, WordPerfect or Microsoft Word file. We can handle either PC or Macintosh diskettes, but please identify this on your diskette. E-mail copies of abstracts are encouraged and should be sent to [wbeck@physics.arizona.edu](mailto:wbeck@physics.arizona.edu). Advance copies of abstracts are also encouraged, as this will allow us to devise the program. Please send final abstracts for all sessions and pre-conference workshops by Feb. 1, 1996 to: **AMS-7 Abstracts, NSF-Arizona AMS Facility, Physics Building, The University of Arizona, Tucson, AZ 85721, USA. Please make sure you indicate whether the paper is for a workshop or the main conference.**

**DEADLINE FOR ABSTRACTS IS FEBRUARY 1, 1996**

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### TRANSPORTATION

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The workshop and conference locations and hotels can be conveniently reached by several means. Travel between the San Francisco Bay Area (for Livermore), San Diego and Tucson by air is frequent and inexpensive. Complete details of these and other travel possibilities will be included in the THIRD CIRCULAR. **Southwest, America West** and other airlines provide direct flights to Phoenix (*with very reasonable fares*) from Oakland, San Francisco and San Diego, with connections to Tucson International Airport via Phoenix, Las Vegas or Los Angeles. There are two non-stop flights per day on Southwest Airlines from San Diego to Tucson. Frequent bus and van shuttle service from Phoenix Airport to Tucson is also available. If there is sufficient interest, we may run a direct bus from the Scripps Institution to the Westward Look Resort in Tucson. The THIRD CIRCULAR will provide detailed information on all travel arrangements.

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## POST-CONFERENCE FIELD TRIP

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Arrangements are underway for a **POST-CONFERENCE TOUR**. We have received over 30 responses showing interest in the post-conference tour. This tour will be limited to 45 participants. The trip will include four days/three nights, with overnight stops in Sedona, Flagstaff and northeastern Arizona. Other highlights of the trip will include a visit to prehistoric ruins at **Montezuma Castle, Flagstaff**, the impressive **Grand Canyon**, archaeological ruins and the volcanic cone of **Sunset Crater**, the beautiful **Canyon de Chelly** located on the Navajo Reservation on northeastern Arizona, **Hubbell's Trading Post, Walnut Canyon** with more evidence of the extensive Anasazi pueblo culture, **Oak Creek Canyon**, and the beautiful town of Sedona (for restaurants and shopping). We expect this tour to cost \$400 per person, double occupancy. We can arrange a roommate for you, but if you require a single room, the cost will be \$600.

**For further information, contact us at the address below, or return the questionnaire sent with the first circular:**

AMS-7 Conference Field Trip  
NSF Arizona AMS Facility  
The University of Arizona  
Physics Building  
Tucson, AZ 85721 USA

Tel.: (520) 621-6816  
Fax: (520) 621-9619

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## CONFERENCE WORKSHOPS

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**Please contact the organizers for further information**

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### GLOBAL CHANGE

**Applications of AMS to Global Change Research**

**Scripps Institution of Oceanography**

**La Jolla, California**

**May 18, 1996**

There are many applications of AMS to **Global Change Research**. This workshop will be held at the Scripps Institution of Oceanography, on cliffs overlooking the **Pacific Ocean** in La Jolla, California. The workshop will allow new results and discussion of the importance of  $^{14}\text{C}$  AMS dating, other radionuclides and related studies to the important problems of research in oceanography, atmospheric science, geology and other fields to the understanding of how our climate has changed in the past, and may change in the future. The conference hotels will be within easy reach of the Scripps Institution, restaurants and the beach. A highlight of the workshop will be a reception on Saturday evening, May 18, in the beautiful Scripps Aquarium, which is on a hill overlooking La Jolla and the Pacific Ocean. Lodging information will follow in the **THIRD CIRCULAR**.

**Organizers:**

A. J. T. Jull and J. W. Beck  
The University of Arizona  
NSF Arizona AMS Facility  
Physics Building  
Tucson, AZ 85721 USA

Tel.: (520) 621-6810  
Fax: (520) 621-9619

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## POST-CONFERENCE WORKSHOP

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### Applications of AMS to Geological Applications

Westward Look Resort

Tucson, Arizona

May 25, 1996

There are many new applications of AMS to **Earth Sciences**. This workshop will focus on the uses of AMS measurements of different radionuclides for two particular areas: 1) seismic hazards studies and 2) studies of *in-situ*-produced radionuclides, which have much use in geomorphology, studies of uplift, etc. Other specialized applications to the earth sciences are also welcome. This workshop will be held at the Westward Look after the main conference. This will allow a relaxing day of less-formal discussions on these important topics. The workshop will allow new results and discussion of the importance of  $^{14}\text{C}$  AMS dating especially to earthquakes and seismic hazards, other radionuclides and studies to the important problems in the development and use of *in-situ* cosmogenic radionuclides in geologic surfaces. Separate one-half-day sessions will be devoted to each of these two important topics.

The workshop will follow the main Conference on Saturday, May 25th. We look forward to an informative and informal discussion of advances and problems in geological applications.

Organizers:

Dr. George S. Burr  
The University of Arizona  
NSF-Arizona AMS Facility  
Physics Building  
Tucson, AZ 85721  
Tel.: (520) 621-8411  
Fax: (520) 621-9619

Dr. Susan D. Ivy-Ochs  
ETH-Hönggerberg  
Institut für Mittelenergiephysik, HPK G13  
CH-8093 Zürich, Switzerland  
Tel.: 41-1-633-2042  
Fax: 41-1-633-1067

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### PRE-CONFERENCE WORKSHOPS AT LAWRENCE LIVERMORE NATIONAL LABORATORY

Please contact the organizers for further information

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Lawrence Livermore National Laboratory (LLNL) is planning to host two separate pre-conference workshops. LLNL will make all arrangements for these two workshops.

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### WORKSHOP ON $^{129}\text{I}$ AMS

LLNL will host a topical workshop on  $^{129}\text{I}$  studies by AMS on **Thursday, May 16, 1996**. This workshop will include talks about applications of the  $^{129}\text{I}$  AMS technique. For more information about the  $^{129}\text{I}$  AMS workshop please contact:

Mark Roberts  
L-397, LLNL  
P.O. Box 808  
Livermore, CA 94551 USA

Tel.: (510) 422-3431  
Fax: (510) 423-7884  
E-mail: roberts5@llnl.gov

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**WORKSHOP ON BIOMEDICAL <sup>14</sup>C AMS**

The second LLNL workshop will be on biomedical <sup>14</sup>C AMS. This workshop will include talks on sample preparation and handling problems unique to biomedical <sup>14</sup>C AMS. This workshop is scheduled for **Friday, May 17, 1996**. For more information about the biomedical <sup>14</sup>C AMS workshop please contact:

John Vogel  
L-397, LLNL  
P.O. Box 808  
Livermore, CA 94551 USA

Tel.: (510) 423-4232  
Fax: (510) 423-7884  
E-mail: vogel2@llnl.gov

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**AMS-7 CONFERENCE, TUCSON, ARIZONA, MAY 20-24, 1996**

Request for further information

Please return this form only if you did not return the questionnaire in the first circular. If you need further information, or did not return the first circular questionnaire, please return this form by October 1, 1995 in order to receive the third mailing.

Name \_\_\_\_\_

Mail to:

Affiliation \_\_\_\_\_

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Physics Building

Address \_\_\_\_\_

The University of Arizona  
Tucson, Arizona 85721-0081 USA

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Tel. (520) 621-6810

\_\_\_\_\_

Fax. (520) 621-9619

Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_

E-mail: ajtjull@ccit.arizona.edu

E-mail: \_\_\_\_\_

If you are interested in the one-day workshops, please contact the organizers indicated for further information.

I will attend AMS-7 \_\_\_\_\_ I am interested in the post-conference field trip: \_\_\_\_\_

# Faculty Position – *GEOSCIENTIST (AMS)*

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*Purdue University*

*Department of Earth and  
Environmental Sciences*



The Department of Earth and Atmospheric Sciences at Purdue University invites applications for a faculty position in the geosciences. Applicants will be considered at all professorial ranks, and should have particular interest and demonstrated excellence in research using cosmogenic radionuclides. The School of Science at Purdue University operates PRIME Lab, a major research facility for accelerator mass spectrometry (AMS) with the capability to make precise measurements of the cosmogenic radionuclides  $^{10}\text{Be}$ ,  $^{14}\text{C}$ ,  $^{26}\text{Al}$ ,  $^{36}\text{Cl}$ ,  $^{41}\text{Ca}$  and  $^{129}\text{I}$ . The department currently has 27 faculty in the areas of atmospheric dynamics and physics, atmospheric chemistry, geophysics, geochemistry, geomorphology and geology, and over 75 graduate students. Extensive computational and experimental facilities are available within the department, and through collaborative arrangements across the campus as well as with the National Soil Erosion Laboratory.

The successful candidate will be expected to establish an independent research program and participate actively in undergraduate and graduate teaching programs within the department. Formal consideration and review of applications will begin 1 August 1995 and will continue until the position is filled. Salary and rank (appointment) will depend on experience and qualifications. Applications are encouraged from women and minorities. Applicants should send their CV, a statement of their research and teaching interests, and arrange for three letters of recommendation to be sent to:

**Professor Joseph S. Francisco, Chair  
Geoscientist Search Committee  
Department of Earth and Atmospheric Sciences  
1397 Civil Engineering Building  
Purdue University  
West Lafayette, IN 47907-1397**

For more information concerning the PRIME Lab and Department, see World Wide Web (WWW):

<http://Primelab.physics.purdue.edu/>  
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## NOTICE TO READERS AND CONTRIBUTORS

The purpose of *RADIOCARBON* is to publish technical and interpretive articles on all aspects of  $^{14}\text{C}$  and other cosmogenic isotopes. In addition, we present regional compilations of published and unpublished dates along with interpretive text. Besides the triennial Proceedings of Radiocarbon Conferences, we publish Proceedings of conferences in related fields and Special Issues that focus on particular themes. Organizers interested in such arrangements should contact the Managing Editor for information.

Our regular issues include NOTES AND COMMENTS, LETTERS TO THE EDITOR, RADIOCARBON UPDATES and BOOK REVIEWS. Authors are invited to extend discussions or raise pertinent questions regarding the results of investigations that have appeared on our pages. These sections also include short technical notes to disseminate information concerning innovative sample preparation procedures. Laboratories may also seek assistance in technical aspects of radiocarbon dating. We include a list of laboratories and a general index for each volume.

*Manuscripts.* When submitting a manuscript, include three printed copies, double-spaced, and a floppy diskette, single-spaced. We will accept, in order of preference, FrameMaker, WordPerfect 6.0 or 5.1, Microsoft Word, Wordstar or any standard IBM word-processing software program on 3½" or 5¼" IBM disks, or high-density Macintosh diskettes. ASCII files are also acceptable. We also accept E-mail and ftp transmissions of manuscripts. Papers should follow the recommendations in INSTRUCTIONS TO AUTHORS (1994, vol. 36, no. 1). Offprints of these guidelines are available upon request. Our deadlines for submitting manuscripts are:

<i>For</i>	<i>Date</i>
Vol. 38, No. 1, 1996	September 1, 1995
Vol. 38, No. 2, 1996	January 1, 1996
Vol. 38, No. 3, 1996	May 1, 1996

*Half-life of  $^{14}\text{C}$ .* In accordance with the decision of the Fifth Radiocarbon Dating Conference, Cambridge, England, 1962, all dates published in this volume (as in previous volumes) are based on the Libby value, 5568 yr, for the half-life. This decision was reaffirmed at the 11th International Radiocarbon Conference in Seattle, Washington, 1982. Because of various uncertainties, when  $^{14}\text{C}$  measurements are expressed as dates in years BP, the accuracy of the dates is limited, and refinements that take some but not all uncertainties into account may be misleading. The mean of three recent determinations of the half-life,  $5730 \pm 40$  yr, (*Nature*, 1962, vol. 195, no. 4845, p. 984), is regarded as the best value presently available. Published dates in years BP can be converted to this basis by multiplying them by 1.03.

*AD/BC Dates.* In accordance with the decision of the Ninth International Radiocarbon Conference, Los Angeles and San Diego, California, 1976, the designation of AD/BC, obtained by subtracting AD 1950 from conventional BP determinations is discontinued in *RADIOCARBON*. Authors or submitters may include calendar estimates as a comment, and report these estimates as cal AD/BC, citing the specific calibration curve used to obtain the estimate. Calibrated dates should be reported as "cal BP" or "cal AD/BC" according to the consensus of the Twelfth International Radiocarbon Conference, Trondheim, Norway, 1985.

*Measuring  $^{14}\text{C}$ .* In Volume 3, 1961, we endorsed the notation  $\Delta$ , (Lamont VIII, 1961), for geochemical measurements of  $^{14}\text{C}$  activity, corrected for isotopic fractionation in samples and in the NBS oxalic-acid standard. The value of  $\delta^{14}\text{C}$  that entered the calculation of  $\Delta$  was defined by reference to Lamont VI, 1959, and was corrected for age. This fact has been lost sight of, by editors as well as by authors, and recent papers have used  $\delta^{14}\text{C}$  as the observed deviation from the standard. At the New Zealand Radiocarbon Dating Conference it was recommended to use  $\delta^{14}\text{C}$  only for age-corrected samples. Without an age correction, the value should then be reported as percent of modern relative to 0.95 NBS oxalic acid (Proceedings of the 8th Conference on Radiocarbon Dating, Wellington, New Zealand, 1972). The Ninth International Radiocarbon Conference, Los Angeles and San Diego, California, 1976, recommended that the reference standard, 0.95 NBS oxalic acid activity, be normalized to  $\delta^{13}\text{C} = -19\text{‰}$ .

In several fields, however, age corrections are not possible.  $\delta^{14}\text{C}$  and  $\Delta$ , uncorrected for age, have been used extensively in oceanography, and are an integral part of models and theories. Thus, for the present, we continue the editorial policy of using  $\Delta$  notations for samples not corrected for age.

## CONTENTS

## FROM THE EDITOR

<i>Austin Long</i> .....	iii
--------------------------	-----

## FRIENDS OF RADIOCARBON .....

v

## OBITUARY

Robert Stuckenrath

<i>J. M. Adovasio</i> .....	vii
-----------------------------	-----

## ARTICLES

Radiocarbon Dating Evidence for Mammoths on Wrangel Island, Arctic Ocean, Until 2000 BC <i>S. L. Vartanyan, Kh. A. Arslanov, T. V. Tertychnaya and S. B. Chernov</i> .....	1
Mammoth Extinction: Two Continents and Wrangel Island <i>Paul S. Martin and Anthony J. Stuart</i> .....	7
Radiocarbon Dating of Scrolls and Linen Fragments from the Judean Desert <i>A. J. Timothy Jull, Douglas J. Donahue, Magen Broshi and Emanuel Tov</i> .....	11
Storage Conditions and Physical Treatments Relating to the Dating of the Dead Sea Scrolls <i>Niccolo Caldarara</i> .....	21
Intercomparison of High-Precision $^{14}\text{C}$ Measurements at The University of Arizona and The Queen's University of Belfast Radiocarbon Laboratories <i>R. M. Kalin, F. G. McCormac, P. E. Damon, C. J. Eastoe and Austin Long</i> .....	33
Comparing Long-Term Atmospheric $^{14}\text{C}$ and $^3\text{H}$ Records near Groningen, the Netherlands with Fruholmen, Norway and Izaña, Canary Islands $^{14}\text{C}$ Stations <i>Harro A. J. Meijer, Johannes van der Plicht, Jorunn S. Gislefoss and Reidar Nydal</i> .....	39

## PAPERS FROM THE WORKSHOP ON PAGES CHRONOLOGIES

The $^{14}\text{C}$ Age of the Icelandic Vedde Ash: Implications for Younger Dryas Marine Reservoir Age Corrections <i>W. E. N. Austin, Edouard Bard, J. B. Hunt, Dick Kroon and J. D. Peacock</i> .....	53
The Younger Dryas Cold Event—Was It Synchronous over the North Atlantic Region? <i>Tomasz Gošlar, Maurice Arnold and Mieczysław F. Pazdur</i> .....	63
Radiocarbon Dating the Holocene in the Gošciaż Lake Floating Varve Chronology <i>Irena Hajdas, Georges Bonani and Tomasz Gošlar</i> .....	71
Problems in the Extension of the Radiocarbon Calibration Curve (10–13 kyr BP) <i>Irena Hajdas, Susan D. Ivy-Ochs and Georges Bonani</i> .....	75
Dating of Lake and Loess Sediments <i>Juerg Beer and Michael Sturm</i> .....	81

RADIOCARBON UPDATES .....	87
---------------------------	----