

RADIOCARBON

An International Journal of Cosmogenic Isotope Research

announces the publication of

CALIBRATION 1993

A Special Hardcover Edition

Edited by Minze Stuiver, Austin Long and Renée 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}C ages. Calibration procedures are also reviewed.

A 5¼" diskette of the new IBM-PC based program, CALIB 3.0.3B (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}C years.

CALIBRATION 1993 represents the state-of-the art calibration, and provides an essential tool for ^{14}C research and dating.

RADIOCARBON

Department of Geosciences
The University of Arizona
4717 E. Ft. Lowell Rd.
Tucson, Arizona 85712 USA

Please send me _____ copy(ies) of **CALIBRATION 1993** @ \$50.00
Student rate: \$25.00 with student identification
Postage and Handling per book is \$2.50 (U.S.) and \$4.00 (Foreign)

Subtotal _____
Postage _____
Total _____

I have enclosed a check or money order payable to **RADIOCARBON**. Please send my order to this address:

LSC 94

International Conference

Advances in Liquid Scintillation Spectrometry

Glasgow, Scotland
8-12 August 1994

LSC 94 continues the series of conferences held in Gatlinburg, USA in 1989 and Vienna, Austria in 1992. The conference venue will be the Royal Scottish Academy of Music and Drama in Glasgow, Scotland, from 8-12 August 1994. This is the week before the 15th International Radiocarbon Conference, which will also be held at the same location.

The aims of the conference are to promote and encourage the free exchange of information on liquid scintillation spectrometry and related scintillation techniques.

The proposed scientific themes are:

New Instrumentation
Advances in Liquid and Solid Scintillators
Bioscience Applications
Environmental Applications
Alpha Counting
Cerenkov Counting
Data Handling Algorithms/Computer Applications and Software
Sample Handling and Disposal
Other Scintillation Techniques

Contributed papers are welcomed within the themes outlined above and authors are required to submit a 500-word abstract by 31 December 1993 for refereeing. There will also be a major exhibition of the latest commercial instrumentation for liquid scintillation spectrometry and displays of ancillary equipment, supplies and books.

For further conference information please contact the Conference Secretariat
Gordon Cook, Scottish Universities Research & Reactor Centre, East Kilbride
Glasgow G75 0QU, Scotland
Telephone: (44)3552-23332 Fax: (44)3552-29898

15th International Radiocarbon Conference

Glasgow, Scotland
15–19 August 1994

The 15th International Radiocarbon Conference will be held in Glasgow, Scotland in the Royal Scottish Academy of Music and Drama (RSAMD) from 15–19 August 1994, the week immediately following the International Conference on Advances in Liquid Scintillation Spectrometry.

The broad themes of the conference are:

^{14}C in Archaeology
Advances in Beta Counting
Accelerator Techniques
Calibration of the ^{14}C Time Scale
 ^{14}C As a Tracer of the Dynamic Carbon Cycle in Current Environments
 ^{14}C In the Reconstruction of Past Environments

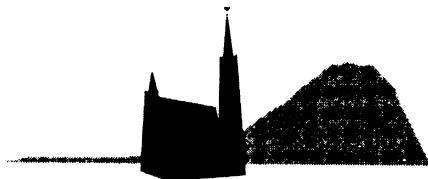
There will be both poster and oral sessions, with no parallel sessions. There will also be opportunities for exhibiting equipment, computer software and books. To complement the main conference program, a number of workshops will be held on the weekend of 13 and 14 August. Topics are ^{14}C in soils, the use of ^{14}C in dating human recolonization after glaciation, the ^{14}C intercomparison (TIRI), liquid scintillation counting techniques, tephra studies and ^{14}C dating, PAGE chronologies, carbon in the oceans and AMS sample preparation. Accommodation, all within walking distance of the RSAMD, ranges from University Halls of Residence to five star hotels. A full social program is also planned, with a welcome party, civic reception, outing, and conference dinner.

Submission of Papers

We welcome contributed papers within the broad themes outlined above. Authors are required to submit a 500-word abstract by 31 December 1993 for refereeing by the Scientific Committee. Within the time constraints posed by our aim of having no parallel sessions for all presentations, the committee will determine the appropriate session and manner of presentation for the accepted papers.

For more information please contact Marian Scott or the Conference Secretariat,
Mrs. M. Smith, Department of Statistics
University of Glasgow, Glasgow G12 8QW, Scotland
Telephone: (44)41 339 8855 Ext. 5024; Fax: (44)41 330 4814
E-mail: GATA24@VME.GLASGOW.AC.UK or
marian@stats.gla.ac.uk

LSC 92



Vienna, Austria
14-18 September 1992

RADIOCARBON

*An International Journal of Cosmogenic Isotope
Research announces the publication of*

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. It includes a history as well as current and future trends in methods and applications in the field.

The methods section contains articles on sample preparation and measurement techniques, scintillators and solvents, alpha measurements and standardization. The next major division is bioscience applications, which includes an assessment of liquid scintillation spectrometry in molecular biology and implications of epidemiological studies. Environmental applications concerning determinations of tritium, radon, radium, uranium and other radionuclides in groundwater, drinking water, soils and agricultural samples are also discussed.

The editors are leading scientists from the United States, Austria and Australia, and the authors are academic scholars and industrial researchers from all over the world. 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

The price for one copy is US \$87 or ATS 950. For *RADIOCARBON* subscribers, the price is \$72 or ATS 790. Orders paid in US\$ should be transferred to the Society's US account #513-27813 at Erste Österreichische Sparcasse Bank, Vienna. Orders paid in Austrian schillings (ATS) should be transferred to account #080-12199 at the same bank. Please add \$11 bank charge. (Credit card orders cannot be accepted.) Alternatively, a check in ATS drawn on an Austrian bank or a Eurocheque may be sent by registered mail directly to:

Austrian Society for LSC, c/o Federal Institute for Food Control and Research,
Kinderspitalgasse 15, A-1090 Vienna, Austria

RADIOCARBON

In Association with the American School of Prehistoric Research, Peabody Museum, Harvard University announces the forthcoming publication of

**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 first section is dedicated to the discussion of TL, ESR, and U/Th dates relevant to the hotly debated issues of the origins of modern humans and the fate of the eastern Mediterranean Neanderthals. The second section provides comprehensive radiocarbon date lists encompassing the past 40,000 years, with special reference to the shift from foraging to agriculture and animal domestication, as well as a critical re-evaluation of the available dates. A special section summarizes the paleoclimates of the area during the last 20,000 years as viewed through the marine, continental, palynological and paleohydrological sequences.

Please send me _____ copy(ies) @ \$45.00

(10% discount for *RADIOCARBON* subscribers)

Postage and handling per book is \$2.50 (U.S.) and \$4.50 (Foreign)

Subtotal _____

Postage _____

Total _____

I have enclosed a check or money order payable to *RADIOCARBON*. Send my order to this address:

Please photocopy this form and send it with payment to: *RADIOCARBON*, Department of Geosciences,
The University of Arizona, 4717 E. Ft. Lowell Rd., Tucson, AZ 85712 USA

RADIOCARBON 1994 PRICE LIST

NEW CALIBRATION 1993 (Vol. 35, No. 1, 1993)	\$ 50.00
Proceedings of the 14th International Radiocarbon Conference (Vol. 34, No. 3, 1992)	\$ 65.00
Proceedings of the International Workshop on Intercomparison of ¹⁴ C Laboratories (Vol. 32, No. 3, 1990)	\$ 40.00
Proceedings of the 13th International Radiocarbon Conference (Vol. 31, No. 3, 1989)	\$ 60.00
Proceedings of the 12th International Radiocarbon Conference (Vol. 28, Nos. 2A & 2B, 1986 – available separately at \$30.00 each)	\$ 60.00
Proceedings of the 11th International Radiocarbon Conference (Vol. 25, No. 2, 1983)	\$ 50.00
Proceedings of the 10th International Radiocarbon Conference (Vol. 22, Nos. 2 & 3, 1980)	\$ 60.00
Vol. 36, Nos. 1–3, 1993	\$105.00/vol. Inst.* \$ 73.50/vol. Ind. \$ 36.75/vol. Stud.**
Vol. 35, Nos. 1–3, 1993 (includes CALIBRATION 1993)	\$105.00/vol. Inst. \$ 73.50/vol. Ind.
Vol. 34, Nos. 1–3, 1992 (includes Proceedings)	\$105.00/vol. Inst. \$ 73.50/vol. Ind.
Vol. 33, Nos. 1–3, 1991	\$ 94.50/vol. Inst. \$ 63.00/vol. Ind.
Vol. 32, Nos. 1–3, 1990 (includes Glasgow Proceedings)	\$ 94.50/vol. Inst. \$ 63.00/vol. Ind.
Vol. 31, Nos. 1–3, 1989 (includes Proceedings)	\$ 90.00/vol. Inst. \$ 60.00/vol. Ind.
Vol. 30, Nos. 1–3, 1988	\$ 85.00/vol. Inst. \$ 55.00/vol. Ind.
Vols. 15–29, 1973–1987	\$ 75.00/vol. Inst.† \$ 50.00/vol. Ind.
Vols. 10–14, 1968–1987	\$ 50.00/vol.†
Vols. 1–9, 1959–1967	\$ 25.00/vol.
Comprehensive Index (1950–1965)	\$ 25.00
Single Issue	\$ 25.00
Single copy of out-of-print Issue	\$ 35.00

SPECIAL PACKAGE OFFER (now includes 9 out-of-print issues):

Full set, Vols. 1–34 (1959–1993) + <i>free</i> subscription for 1994!	\$650.00
Postage & handling for Package Offer:	
USA	\$ 30.00
Foreign	\$ 75.00

***Foreign postage on current volumes \$ 10.00**

†Plus additional charge for copy of out-of-print issue(s)
Postage & handling will be added to back orders

****Student Rate** – with student identification and letter from subscribing sponsor. Back issues available at 1/2 the individual rate.

NOTICE TO READERS AND CONTRIBUTORS

The purpose of *RADIOCARBON* is to publish technical and interpretative articles on all aspects of ^{14}C and other cosmogenic isotopes. In addition, we present regional compilations of published and unpublished dates along with interpretative text. Besides the triennial Proceedings of Radiocarbon Conferences, we publish Proceedings of conferences in related fields. 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 ANNOUNCEMENTS. 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. Book reviews are encouraged. We include a list of laboratories and an author index for each volume.

Manuscripts. Papers may be submitted on floppy diskettes and as printed copy. When submitting a manuscript, include three printed copies, double-spaced. When the final copy is prepared after review, please provide a floppy diskette along with one printed copy. We will accept, in order of preference, WordPerfect 6.0 or 5.1, Microsoft Word, Wordstar or any IBM word-processing software program. ASCII files, MS DOS and CPM-formatted diskettes are also acceptable. The diskettes should be either 3½" (720 k or 1.44 mb) or 5¼" (360 k or 1.2 mb). We also accept E-mail transmissions of manuscripts. Papers should follow the recommendations in INSTRUCTIONS TO AUTHORS (*RADIOCARBON*, 1992, vol. 34, no. 1, p. 177–185). Offprints are available upon request. Our deadlines for submitting manuscripts are:

<i>For</i>	<i>Date</i>
Vol. 36, No. 2, 1994	January 1, 1994
Vol. 36, No. 3, 1994	May 1, 1994
Vol. 37, No. 1, 1995	September 1, 1994

Half-life of ^{14}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}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 ± 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 $\delta^{14}\text{C}$. In Volume 3, 1961, we endorsed the notation, Δ (Lamont VIII, 1961), for geochemical measurements of ^{14}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 Δ 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 Δ , 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 Δ notations for samples not corrected for age.

ASSOCIATE EDITORS

For Accelerator Physics

DAVID ELMORE
ROBERT E. M. HEDGES
D. ERLE NELSON

West Lafayette, Indiana, USA
Oxford, England
Burnaby, British Columbia, Canada

For Archaeology

ANDREW M. T. MOORE
MICHAEL B. SCHIFFER

New Haven, Connecticut, USA
Tucson, Arizona, USA

For Atmospheric Sciences

GEORGE A. DAWSON

KUNIHICO KIGOSHI
DAVID C. LOWE

Auckland, New Zealand
Tucson, Arizona, USA
Tokyo, Japan
Lower Hutt, New Zealand

For Geochemistry

PAVEL POVINEC

MINZE STUIVER

Bratislava, Slovakia
Monaco
Seattle, Washington, USA

For Geophysics

G. E. KOCHAROV
WILLEM G. MOOK

St. Petersburg, Russia
Texel, The Netherlands

For Hydrology

JEAN-CHARLES FONTES

Vienna, Austria

For Ice Studies

HAROLD W. BORNES, JR.
ULRICH SIEGENTHALER

Orono, Maine, USA
Berne, Switzerland

For Oceanography

EDOUARD BARD

ELLEN R. M. DRUFFEL

Gif-sur-Yvette, France
Palisades, New York, USA
Marseille, France
Irvine, California, USA

For Paleobotany

CALVIN J. HEUSSER

Tuxedo, New York, USA