



## 3rd INTERNATIONAL SYMPOSIUM

# ***<sup>14</sup>C and ARCHAEOLOGY***

LYON, FRANCE

**6–10 APRIL 1998**

The 3rd International Symposium <sup>14</sup>C and Archaeology will be held in Lyon, France, at Claude-Bernard University, from Monday, April 6, through Friday, April 10, 1998.

This conference is intended to allow archaeologists and <sup>14</sup>C specialists to meet and interact. It is especially meant to draw up chronological syntheses based upon <sup>14</sup>C dates, while also reviewing recent advances in radiocarbon technology.

### **The broad themes of the symposium are:**

- <sup>14</sup>C date series, archeological sites and cultures
- Chronology of transitional periods: Middle/Late Paleolithic, Neolithisation ...
- Use of the <sup>14</sup>C method in the study of historical times, from Ancient Egypt to the 15th century
- Recent methodological advances: new dating materials, improvement in calibration, <sup>14</sup>C dates and paleoenvironmental studies ...
- <sup>14</sup>C dating contribution to specific archaeological problems: early human settlement in America and Oceania, preliminary chronological syntheses in Asia, dating of early metallurgy in Africa ...

There will be both poster and oral sessions, without parallel sessions. The symposium will be conducted in English and French with simultaneous translation.

Post-conference field trips to archaeological sites will be organized in the Rhône-Alpes area.

**Organizing Committee:** (Lyon, France)

Jacques EVIN and Christine OBERLIN (Centre de Datation par le RadioCarbone)  
Olivier AURENCHE and Jean-François SALLES (Maison de l'Orient Méditerranéen)  
Jean-Pierre DAUGAS and Michel PRESTREAU (Service Régional de l'Archéologie)

**International Committee:**

A. BROGLIO (Italy)	J. FORTEA-PEREZ (Spain)
A. GALLAY (Switzerland)	A. N. GARRARD (United Kingdom)
R. HEDGES (United Kingdom)	J. KLAPSTE (Czech Republic)
W. G. MOOK (The Netherlands)	J. SIMEK (United States)
C. STRAHM (Germany)	Ö. TUNCA (Belgium)
M. VAN STRYDONCK (Belgium)	H. T. WATERBOLK (The Netherlands)



For further information to be given in the first circular in June 1996, contact :

Secretariat of the <sup>14</sup>C and Archaeology symposium,  
Centre de Datation par le RadioCarbone - Bâtiment 217 -  
43, Bld du 11 Novembre 1918 - 69622 Villeurbanne-Cedex, France  
**Tél:** (33) 72 44 82 57 **Fax:** (33) 72 43 13 17 **E-mail:** cdrc14@cismsun.univ-lyon1.fr

**14**  **RADIOCARBON**  
**1996 PRICE LIST**

<b>Proceedings of the 15th International Radiocarbon Conference</b> (Vol. 37, No. 2, 1995)	\$75.00*
<b>Liquid Scintillation Spectrometry 1994</b> (Proceedings of 1994 Glasgow Conference) (\$75.00 for <i>RADIOCARBON</i> subscribers; 1996)	90.00
<b>Liquid Scintillation Spectrometry 1992</b> (Proceedings of 1992 Vienna Conference) (\$75.00 for <i>RADIOCARBON</i> subscribers; ISBN: 0-9638314-0-2; 1993)	90.00
Special combination offer— <b>LSC 92</b> and <b>LSC 94</b> —save \$30.00	150.00
<b>Late Quaternary Chronology and Paleoclimates of the Eastern Mediterranean</b> (\$50 for <i>RADIOCARBON</i> subscribers; ISBN: 0-9638314-1-0; 1994)	55.00
<b>Calibration 1993</b> (Vol. 35, No. 1, 1993; includes CALIB 3.0.3C program)	35.00
<b>Radiocarbon After Four Decades</b> (Published with Springer-Verlag) (Payable to Springer-Verlag; \$73.50 for <i>RADIOCARBON</i> subscribers; ISBN: 0-387-97714; 1992)	98.00
<b>Proceedings of the International Tree-Ring Conference</b> (TREE RINGS, ENVIRONMENT AND HUMANITY) (Payable to <i>ICTREH/Tree-Ring Society</i> ; 1996)	65.00

**SUBSCRIPTION RATES VOLUME 38, Nos. 1-3, 1996**

<b>Institution</b>		<b>115.00†</b>
<b>Individual</b>		<b>85.00‡</b>
Laboratory Package #1	Subscription, datelists online + diskette, 3 free pages	300.00
Laboratory Package #2	Datelists online + diskette, 3 free pages	200.00
Individual Package	Subscription, datelists online + on diskette	100.00
<i>RADIOCARBON</i> 1996 Datelists	For downloading <i>via e-mail</i>	30.00
Diskette copy	Please specify IBM or Mac format	10.00
Printed copy	Available annually	10.00
Lifetime Subscription—Institutional		2000.00
Lifetime Subscription—Individual		1250.00

<b>SINGLE ISSUES</b> (except conference proceedings and special issues)	35.00
VOLUMES 1-9 each volume	35.00
VOLUMES 10-21 each volume	65.00
VOLUMES 22-37 each volume	100.00
Radiocarbon Conference Proceedings (back issues only)	50.00

**SPECIAL FULL-SET OFFER—Volumes 1-37 (1959-1995)** 800.00

*BIG SAVINGS. Includes 11 out-of-print issues and 1995 <sup>14</sup>C Proceedings. \$50 discount on each additional set.*

Postage & handling	USA	35.00
	Foreign	75.00

**ISSN: 0033-8222**

\*Surface postage and handling charges will be added to book orders and back issues. For airmail delivery, please contact *RADIOCARBON* for rates. Payment accepted in U.S.\$ only.

†**Subscription postage:** add \$10.00 for foreign.  
‡**Student rates:** ½ the individual rate for subscriptions and book orders. Please provide copy of student ID.

## 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. 39, No. 1, 1997	September 1, 1996
Vol. 39, No. 2, 1997	January 1, 1997
Vol. 39, No. 3, 1997	May 1, 1997

*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

INTRODUCTION	
<i>A. J. T. Jull</i> .....	iii
ACKNOWLEDGMENTS .....	iv
AMS-7 CONFERENCE ABSTRACTS .....	1
OVERVIEW OF SANTA FE WORKSHOP	
Overview of the Workshop on Secular Variations in Production Rates of Cosmogenic Nuclides on Earth	
<i>John C. Gosse, Robert C. Reedy, Charles D. Harrington and Jane Poths</i> .....	135
SANTA FE WORKSHOP ABSTRACTS .....	149