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COVER: On Dec. 23, 1975, the United States announced its intention to formally adopt the metric system of weights and measures, becoming the last major country to do so. Industry and government have already responded, primarily by increased reference in their products and documents, to both customary and metric units. Meanwhile, many American citizens are expressing their displeasure over the idea and have succeeded in thwarting some government metric efforts. See p. 42. (Illustration by Ann Lunsford)

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Editorial and Business Offices
1719 N Street, N.W.
Washington, D.C. 20036

Subscription Department
231 West Center Street
Marion, Ohio 43302

Subscription rate: 1 yr., \$12.50; 2 yrs., \$22; 3 yrs., \$30. (Add \$2 a year for Canada and Mexico, \$3 for all other countries.) Change of address: Four to six weeks' notice is required. Please state exactly how magazine is to be addressed. Include zip code.

Printed in U.S.A. Second class postage paid at Washington, D.C. Title registered as trademark U.S. and Canadian Patent Offices.

Published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N.W., Washington, D.C. 20036 (202-785-2255) TWX 710-822-9433 SCIEN NEWS.

LETTERS

New C-14 dating technique

It is one thing for the New York Times and Time recently to credit the new carbon-14 dating technique to a team based in Rochester without mentioning the person who first published as a serious proposal the suggestion of using a high-energy accelerator for this purpose. But when the authoritative SCIENCE NEWS ("C-14 Dating: New Possibilities," SN: 6/25/77, p. 405) similarly ignores the lead article in the 29 April 1977 issue of the journal SCIENCE, then a letter of this kind is called for.

That article was entitled "Radioisotope Dating with a Cyclotron" by Richard A. Muller, and when it was circulated in preprint form as LBL-5510 in September 1976, it elicited the following comments from Willard Libby, the inventor of radiocarbon dating. Libby wrote: "I have read Richard Muller's brilliant article and I am entranced by the possibilities" and "His plan to use the 88-inch cyclotron for radiocarbon dating is the most exciting idea in the whole field of radioactive dating I have heard in many years."

The abstract to Muller's article lists exactly the same several advantages of the "accelerate the C-14 atoms, and count-them-one-by-one technique" as are claimed by the Rochester group. Muller's important paper was not simply a theoretical exercise; he described a dating experiment that used his technique to find the age of a water sample by counting the tritium atoms that were accelerated to high energy in a cyclotron and identified by the same techniques more recently used by the Rochester group. At the American Physical Society meeting last April, Muller and his associates reported their preliminary success in separating C-14 from N-14 using the range technique described in Muller's SCIENCE article; the problem of separation is quite straightforward and is in no sense "virtually impossible" as your article states.

Luis W. Alvarez
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A comment in the article "Carbon-14 dating: New possibilities" (SN: 6/25/77, p. 405) implies that past carbon-14 dating techniques assumed that the ratio of atmospheric C-14 to C-12 remained constant throughout history. The article also states that the new C-14 dating

method can detect variations in this ratio. In fact, variations in atmospheric C-14 have been measured and are part of the evidence for the Maunder minimum, a period of decreased solar activity (SN: 3/6/76, p. 154). Apparently the author of this article meant that the new dating technique would allow better measurements of the variations.

Brent Warner
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(We didn't mean to leave open the implication that the C-14 ratio remains always constant, since it clearly does not. The phraseology proposed in Warner's final sentence would have been more precise.—Ed.)

Thunderstorms and solar flares

Your report that Holzworth and Mozer of the University of California at Berkeley have found global thunderstorm activity to increase following solar flare eruptions (SN: 6/18/77, p. 389) was welcome news to us. Their experimental results, given at the American Geophysical Union meeting in Washington in early June 1977, verify the theoretical predictions presented at the AGU meeting in San Francisco in December 1976 by myself and Richard A. Goldberg of Goddard Space Flight Center.

Our theory addresses the basic physical mechanisms required to couple the flare-associated solar energy bursts into the atmosphere and trigger thunderstorm activity. It predicts that the combined effects of solar proton enhancements above a 20-kilometers altitude and of galactic cosmic ray decreases in lower heights alter the electrical state of the atmosphere in such a way that the probability of thunderstorm occurrence is increased. Specifically, atmospheric conductivity is increased above 20-km altitude and reduced at lower heights; the inversely proportional atmospheric electrical field thereby increases at low heights and decreases above 20 km, as observed experimentally by Holzworth and Mozer.

This theory requires further refinement and experimental verification before it can be accepted as scientific fact; the measurements mentioned in your article will be helpful in this regard.

John R. Herman
President
Radio Sciences Co.
Melbourne, Fla.

Our printer's typesetting computer was struck by lightning and put out of commission for five days this week. Variations in type in this week's issue are due to the necessity of typesetting on a variety of different equipment.—Ed.

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