

## CHEMISTRY

# Cosmic Rays Make Carbon

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►COSMIC RAYS are constantly creating radioactive carbon, and apparently have been doing so for ages. Since carbon is an essential element in all living things, we are all full of these radioactive atoms, take in more with every mouthful of food we eat, lose some in our body wastes and with every breath we exhale. What role this ray-created radioactive carbon plays in our lives nobody knows, for its existence has only just been discovered.

There were theoretical reasons for supposing it might exist, but demonstration of its actual presence in living organisms and in recently dead organic matter was announced in *Science* (May 30), by a six-man research team.

The theoretical suggestion with which they started was that if a cosmic ray should strike a nitrogen atom in a certain way it would convert it into an atom of radioactive carbon, with an atomic weight of 14, as compared with 12 for ordinary carbon. Carbon 14 is fairly long-lived for a radioactive element; its half-life is 5,000 years. But given long enough, it all breaks down into other elements and thus vanishes.

The researchers tackling the problem reasoned that if they could get carbon samples of very recent organic origin, some of the atoms might be of the  $C_{14}$  variety. Contrariwise, carbon samples of quite ancient organic origin should contain few or none of these radioactive atoms.

An easy way to collect carbon samples is to capture some methane gas, which has one atom of carbon and four of hydrogen in each of its molecules. Methane is produced in the bacterial fermentation of decaying matter; it is also given off by some kinds of petroleum.

The researchers got their "recent" methane from Baltimore's city sewage disposal plant, their "ancient" gas from crude oil. They used the lofty towers of a commercial oil refinery to concentrate their samples, in order to get the largest possible quantity of radioactive carbon in a relatively small volume. Then they tested their two samples with Geiger counters, which, as everybody has known since Bikini, sound off with a tick when

a radioactive atom explodes in their vicinity.

They had previously calculated the number of ticks they ought to get per minute from "recent" methane, or as they called it, biomethane. The Geiger counters ticked off a count very close to the calculated value. From the "ancient" or petromethane they got very few ticks, which was also according to previous calculation.

They now think that the radioactive carbon content can be used as a means of telling the age of any given piece of organic material that hasn't been dead too long—a Pharaoh's mummy, for example, or the skull of a cave man.

The research team that did this work consists of E. C. Anderson and W. F. Libby of the University of Chicago, and S. Weinhouse, A. F. Reid, A. D. Kirshenbaum and A. V. Grosse of the Houdry Process Corporation.

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## METEOROLOGY

## Damage to Wheat Crop From Cold Wave Expected

►DAMAGE to the wheat crop from the sudden and dismaying cold wave that hit the Plains area and the Midwest last week and then moved into the Great Lakes region and the Ohio valley is expected by scientists at the U. S. Weather Bureau.

Sample minimum temperatures were: Cheyenne, Wyo., 16; Grand Island, Neb., 24; Valentine, Neb., 26; Sioux City, Iowa, 27. These degrees of chill are enough to do material harm to both winter and spring wheat, upon which world hopes of freedom from want in the coming winter largely depend. Millions of family vegetable gardens, planted to fight the high costs of food, have undoubtedly been blighted, as well as more extensive truck farms intended to supply city markets.

There is one bright spot in the picture—which oddly enough is a result of previous unfavorable weather. Because it has been so wet and chilly all spring throughout the great central valley of this country, corn and soybean planting has been

much delayed. A considerable part of the acreage in these two important crops is still unplanted, and most of the seed in the ground has not yet sprouted. It is probable therefore that corn and soybeans suffered little damage.

This cold wave, most unusually severe for this late date, is a result of a kind of meteorological sideswipe, Weather Bureau meteorologists say. First, a storm area of Pacific origin moved eastward across the mountains. Then a great mass of Arctic cold air came down from Canada. Their clash over the High Plains in the West is what gave Denver its heavy snowfall. Progress of the storm area sucked the cold air after it, bringing the country-wide sweep of the cold wave.

*Science News Letter, June 7, 1947*

## FOOD TECHNOLOGY

## Dehydrating by "Thirst"

►DEHYDRATED foods, usually prepared by one or another type of heating process, are made on a new basis in the process covered by patent 2,420,517, issued to J. D. Brandner and R. M. Goepf, Jr., Atlas Powder Company chemists. They get most of the water out of vegetables and fruits by exposing them to exceedingly "thirsty" compounds, such as some of the sugars, and merely finish the job by evaporation.

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**DETECTOR**—This device detects moving objects by the reflection of radio waves. The light comes on when an object or a person is moving toward or away from the equipment.