

RADIOBIOLOGY

Unlocking Plant Secrets

"Tagged" molecules are tracing plant life processes. Peacetime uses of radioactivity will outweigh destructive use of atomic fission.

➤ **SUGAR FORMED** in one leaf of a large sugarcane plant during one hour's work in the sun was distributed to all parts of the 11-foot, seven-pound stalk within three days. This hitherto unsuspected fact of plant life was demonstrated through the use of carbon atoms "tagged" with radioactivity at the Clinton Laboratories atomic pile and sent to Honolulu for research purposes.

Traced Through CO₂

In the Honolulu laboratories of the Hawaiian Sugar Planters' Association, Dr. George O. Burr and his co-workers combined the radioactive carbon with oxygen to make carbon dioxide. This "tagged" CO₂ they fed to one leaf of a large sugarcane plant for one hour on a sunshiny day. The sugar thus formed was found wherever it went in the plant by pointing a Geiger counter at various parts. Most of the "ticks" that betray the presence of radioactive matter came from the young, growing parts of the cane: root-tips, stem-tip, newest leaf. But there was radiosugar in all parts except a few of the oldest leaves.

Now the Honolulu researchers are making up larger quantities of radiosugar, to be sent to other laboratories for nutritional studies on animals. It will be traced through their bodies just as it was traced through the sugarcane stalk. One sample of radiosugar has already been sent to Dr. Harlan G. Wood of Western Reserve University in Cleveland, Ohio, who will pry its complex molecules apart to see just where the radioactive carbon atoms are built in.

This is only one sample, out of scores of research projects that have been started since radioactive elements were first made available for use in peacetime investigations of biological, medical, agricultural and industrial problems, only one year ago, and less than two years after the blasting of Hiroshima. More than 1,000 shipments of radioactive elements and compounds have been made thus far.

Another plant research project of both theoretical and practical importance in-

volves the use of radioactive iron. Iron is needed in small quantities by all green plants; it is an indispensable catalyst in the formation of chlorophyll, the green pigment that captures sun-energy and uses it in making sugar. Phosphorus, another element essential to plant life, under certain conditions "acts cussed", and blocks the iron entry through the roots. Then the plant becomes pale and anemic-looking—chlorotic, in the plant physiologist's jargon. Chlorosis is more than a laboratory term: fruit trees suffering from it cost American orchardists millions of dollars every year in lost yields. So Dr. Orlin Biddulph of the State College of Washington is working on this phosphorus-iron antagonism with tracer atoms of radioactive iron.

From Soil to Milk

At the University of Florida, a radio-tracer research task begins with the soil in a cow pasture and winds up in baby's bottle. Radioactive elements, especially cobalt and copper, necessary though only in minimal amounts, are introduced into the soil. Thence they are traced into the grass and legumes that grow from the soil, into the cow that eats the plants, through her into her milk and thus to the ultimate consumer.

These three examples of radiobiological research are only random samples taken from scores of similar projects being carried on in dozens of laboratories and field stations. Among other radioactive elements from the atomic pile in Oak Ridge that are being used in these researches are sulfur, iodine, calcium, potassium, sodium and beryllium.

Industry as well as biology and agriculture is making use of "tagged" atoms. Radioactive iron incorporated into steel is used in studies of frictional wear. Radiocalcium in cement helps to place more accurately the sealing-off layers of concrete deep in oil wells, that block ruinous water-flows. Radiosulfur is helping metallurgists to understand better what happens to this nuisance element in iron smelting. And so on almost indefinitely.

Peacetime uses of atom-splitting have of necessity lagged behind the develop-

ment of the atom bomb. But they bid fair to overtake and pass this first destructive use of atomic fission.

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RADIO

Jeep Gets Voice and Ears

➤ **VOICE AND EARS** have been added to the jeep in the form of a high-powered two-way radio, to be used in the Navy. Self-powered, the new radio can be used even when the vehicle is running six feet under water. The receiver is so small that it can fit into the glove compartment.

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