

GENERAL SCIENCE

1954 Science Review

Top achievement of past year may be beginnings of direct production of electricity by atomic radiation. Mass trial of polio vaccine and scientific insecurity also noted.

This summary of the year's happenings in the world of science is limited by space to just the highlights. Most of the events are described in detail in the pages of SCIENCE NEWS LETTER for the current year. If you wish to refer to any particular report, you may find it readily through the index. (See SNL, June 26, and also the issue which will appear next week, Dec. 25.)

By SCIENCE SERVICE STAFF

See Front Cover

► THE YEAR 1954 in historical retrospect may be noted for man's first approaches toward converting atomic energy directly into electricity, or the first practical use of solar batteries converting sunlight directly into electricity.

Atomic and solar batteries are still inconsequential for power purposes. The Dixon-Yates power controversy involving the AEC, although fundamentally unconcerned with the matter of atomic power, overshadowed the research developments or even the continual progress toward atomic power plants.

Of great importance in the world's future energy and food supply is the progress made during 1954 in the understanding of the mechanism of photosynthesis and the demonstration of the process in non-living material extracted from the plant.

Perhaps this will lead to a way of capturing the sunshine's energy outside the green leaf. An industrialization of this process would bring power to areas of the world now barren of available energy.

The cigarette came under indictment, upon circumstantial evidence, as increasing the death rate not only from lung cancer but from all forms of cancer and from coronary artery disease. A statistical study of men ages 50 to 70 showed that the death rates of heavy cigarette smokers, meaning a pack or more a day, more than doubled for cancer and nearly doubled for coronary disease, compared with non-smokers.

Public reaction was marked and the whole question of the use of tobacco came under renewed inquiry.

Mass trials of a vaccine against poliomyelitis were made upon a million and a half school children, but whether it works or not will not be known until next year. Experts, however, are pretty well agreed that the mass inoculations, beginning in 1953, with a different substance, the gamma globulin blood fraction, had no beneficial effects on the spread and severity of polio.

In aviation, the greatest progress may have been in the field of guided missiles, much of it under cover of necessary mili-

tary secrecy. Various kinds of rocket and jet missiles for intercepting and for attack went into service. The U. S. Air Force completed the conversion of its fighter wings to jets.

Most spectacular development in flying was the new-type plane, called Pogo, that takes off straight up and then lands tail first, obviating the necessity of large landing space. Applicable to fighter planes, its first use will be by the U. S. Navy since space aboard ships is at a premium.

There is also a convertiplane that uses the helicopter principle to take off vertically and then flies forward in a conventional manner.

The exploration of the heavens made progress, particularly through use of the relatively new techniques of observing radio waves from outer space. Such radio radiation generated by hydrogen gas filling the space between the stars was observed and studied, giving information about the structure of the center of the galaxy in which our solar system is located, the Milky Way.

Shown on the cover of this week's SCIENCE NEWS LETTER is the 17-foot radio telescope set up at Sydney, Australia, by the Commonwealth Scientific and Industrial Organization. A double exposure was used to get the stars and antenna separately.

An as yet unsuccessful search for little "moons," or earth's satellites too small to be seen, gave scientists hope that such a natural space platform might be found. Such an observing post, if discovered and reached by rocket, might dominate the world militarily. Less ominously, it would be an observatory beyond the earth's atmosphere that could add much to astronomical knowledge.

Exploding atoms, or radioactive isotopes, are important tools of investigation. One of these atoms is tritium, the triple-weight form of hydrogen. It is generated by cosmic rays in the upper atmosphere, and combines there with oxygen, falling as water.

Tritium decays at such a rate that half disappears in 12.5 years. This has allowed the determination of the age of rain as three weeks. On the average, moisture stays aloft that length of time. Wherever geologists and meteorologists want to date water, the tritium method is used. They have found that rain mixes with ocean water to a depth of only about 150 feet.

The exploration of man's antiquity continued. In the Western Hemisphere, radiocarbon dating showed that man has lived in the New World for more than 23,800 years, the limit of such dating, instead of

about 12,000 years, as previously thought.

A human skull, at least 12,000 years old, and possibly much older, was found associated with animal fossils near Midland, Texas. A rock shelter occupied nearly 11,000 years ago was found in Illinois. It was pronounced the oldest dated Indian home east of the Mississippi.

In the Old World, archaeologically-splendid Egypt produced a solar boat built to carry the Pharaoh Cheops to heaven. Possibly the oldest home in the world, a cave continuously lived in for as much as 150,000 years, was explored in Iraq.

Preparations were made among the nations for the International Geophysical Year, a period in 1957-58 during which expeditions and observations will record and investigate many aspects of the earth, oceans and atmosphere.

The issue of security in government work created a large amount of insecurity among scientists. The revoking of the AEC security clearance of Dr. J. Robert Oppenheimer, and similar reinvestigations of numerous scientists who have contributed materially to atomic energy and other defense research, caused concern in scientific circles and more reluctance to engage in classified government research.

Federal grants for non-secret fundamental research were withheld from some investigators with liberal tendencies.

Denial of visas to visit the United States of foreign scientists who had been invited to attend scientific meetings here caused an adverse effect abroad upon the U. S. reputation for democracy and fair play. Similarly, denial of passports to some U. S. scientists for trips abroad interfered with normal international flow of scientific interchange.

The barrier of language in scientific and medical communication was lessened by the successful use of Interlingua, the new international language, in a dozen journals and several international conferences, primarily for abstracts of medical and technical papers.

Interest increased in the problem of increasing the number of scientists, engineers and technologists available to our civilization for industry and defense.

The rate of producing well-trained scientists and engineers was reported to be higher in the Soviet Union than in the United States, although the United States still leads in numbers actually at work: 500,000 engineers and 200,000 scientists in the U. S., compared with about 400,000 engineers and 150,000 scientists in the Soviet Union.

A survey showed that half of the most promising seven percent of the nation's youth do not go to college, a waste of human resources.

Significant advances were made in interesting high school youth to do science projects for exhibit in science fairs, a method of encouraging potential participation in science and technology. The number of science fairs at various localities rose above 50.

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