GENERAL SCIENCE

Plant Cancer Experiments Basis For Study in Animals

It Should Now Be Possible To Investigate Fundamental Cellular Changes Which Are Problem's Biological Bases

BECAUSE of experiments showing that cancer spreads in plants much as it does in animals, Dr. Philip R. White of the Rockefeller Institute for Medical Research, Princeton, N. J., told the American Philosophical Society that it should now be possible to investigate more thoroughly the "fundamental cellular changes which are the biological bases of the cancer problem."

Dr. White has demonstrated that cancers of plants, called crown galls, can be transplanted or occur naturally without the aid of the germ that caused the primary growth. What happens in the plant is strikingly parallel to the metastasizing or spreading of an animal or human cancer.

For more than a year tissues from the secondary tumors, which are bacteria free, have been grown by Dr. White outside the plant in vitro. Grafted into either sunflower or artichoke plants, they produce typical crown-gall tumors.

Science News Letter, May 2, 1942

Light Metals Fuel Stars

THE VARIABLE stars, used by astronomers as "yardsticks" of the heavens, in all probability are kept glowing by subatomic transmutations depending upon lithium, beryllium and boron, Drs. Cecilia Payne-Gaposchkin and Sergei Gaposchkin of the Harvard College Observatory, Cambridge, Mass., told the society.

The central temperatures for intrinsic variable stars are found to be too low to be kept fueled by carbon, the way in which it is believed most stars are kept supplied with energy.

Science News Letter, May 2, 1942

Reptiles Once Deaf

THE VERY early forms of reptiles and amphibians were deaf and such perception of sound that they may have had was more tactile than auditory, Dr. Ermine C. Case, professor emeritus of historical geology and paleontology at the University of Michigan, told the scientists.

The ear structure of the geologically younger creatures similar to our snakes and frogs could not respond to air vibrations of ordinary intensity and frequency, Dr. Case has found.

Mammals of today do hear as man hears, the evidence indicates, but the auditory apparatus of fish, amphibians and reptiles is deficient. Birds probably hear in the same way as human beings although their hearing apparatus is less elaborate.

Science News Letter, May 2, 1942

America's First Invasion

SIBERIA holds the secret as to when the first human beings came to America, how they got here and whence they came, Dr. Edgar B. Howard, vice-director of the University of Pennsylvania Museum told the American Philosophical Society.

Science cannot yet give a definite answer to the query: How old is man in America?

Opinion in archaeological and anthropological circles revolves about the estimate of about 10,000 years ago for the advent of man on this continent, Dr. Howard explained, but extreme estimates range from about 2,000 B.C. to 70,000 years or more ago.

"Many secrets, so far as our own country are concerned, are locked up in Siberia," Dr. Howard said. "Until we know more of the glacial geology, anthropology, and archaeology of this region, we cannot hope to answer, with any degree of satisfaction, questions such as that relating to migration routs, the culture stage reached by these early wanderers, and many others which are necessary as a foundation to a real understanding of American prehistory."

The discovery in a cave at Folsom, New Mexico, some fifteen years ago of a number of specialized spearpoints made by primitive Americans, gave much impetus to investigation of the earliest phases of American archaeology. The controversy, however, between those who held to the view that man was a recent arrival in the New World, and those who held the opposite opinion, has continued. (*Turn to next page*).

Science News Letter, May 2, 1942

FINAL ASSEMBLY

In one of America's huge airplane assembly plants located inland "somewhere in the United States," the Curtiss P-40 fighters in the foreground are being put together side by side with the 25-ton Curtiss "Troopships of the Sky" (left background).

Before Crater Lake

HUMAN beings lived in Oregon before a gigantic volcanic explosion blasted a mountain and formed famous Crater Lake, between 5,000 and 10,000 years ago.

Dr. L. S. Cressman, head of the University of Oregon's department of anthropology, reported the discovery in caves of camp fires and camp debris blanketed with pumice from the eruption.

"These eastern Oregon caves show the transition from the atlatl or spear thrower to the bow and arrow," Dr. Cressman said. "Fine twined basketry, the most conspicuous type of article found in the caves, must have been brought in by migratory peoples, for it appears completely developed immediately following a period without basketry. In the eastern caves near the end of occupation were found a few fragments of coiled basketry. Well beneath the pumice in one of the stratified caves were found chipped obsidian tools, bones of horse, camel and several other genera along with the camp fires used to cook the flesh of these animals."

Science News Letter, May 2, 1942

Distance Not Abolished

DESPITE the airplane and its swift flight, it is not correct to say that for modern life "distance has been virtually abolished," Dr. John Q. Stewart, associate professor of astronomical physics at Princeton, told the meeting.

The fallaciousness of this idea was illustrated, Dr. Stewart said, speedily and spectacularly by the fall of unsupported Hong Kong and Singapore, which had been British possessions for a total of 215 years. Although military science stresses the significance of distance when armies are to be maintained far from home, the importance of the distance factor for general social relations is not well recognized.

Prof. Stewart put forth the idea that the influence of a group of people tends to be proportional to their number divided by their distance away.

Social influences weaken with distance much as physical ones, he said, and thus some of the relations of celestial mechanics are brought "down to earth."

Science News Letter, May 2, 1942

In the past, approximately 90% of the paint brushes used were made of black *Chinese hog* bristles.

BIOLOGY

Animals as Well as Plants Use Carbon Dioxide in Cells

New Finding With Revolutionary Effects Possible Through Radioactive Carbon Atoms Fed to Animals

REVOLUTIONARY in its effects on our ideas of life processes, discovery that animals use carbon dioxide in the nourishment of their cells and tissues was laid before the American Chemical Society in Memphis by Dr. E. A. Evans, Jr., of the University of Chicago, recipient of the Eli Lilly award in biological chemistry.

The new finding, which was made possible only through the radioactive "tagging" of carbon atoms in the compounds fed to the animals studied, breaks down the old, simple doctrine on which all students, even in elementary schools, are brought up, that "plants take in carbon dioxide and give off oxygen; animals take in oxygen and give off carbon dioxide as a waste product."

It is almost as if an engineer had announced the discovery that cinders could be burned in furnaces. The carbon atoms were "tagged" by being made radioactive in the University of Chicago cyclotron. The buildup of carbon dioxide containing these atoms into complex organic compounds was traced in muscle and liver tissues.

Two of Dr. Evans' associates, Dr. L. Slotin and Dr. Birgid Vennesland, collaborated with him in preparing water solutions from dried liver tissue which contain enzymes able to convert the carbon dioxide into the larger organic molecules.

Science News Letter, May 2, 1942

CHEMISTRY

Synthetic Cellobiose Made For First Time by Chemists

Resulting Knowledge of Cellulose Can Be Utilized In Making Explosives, Rayon, Plastics and Wrappings

BASIC understanding of cellulose, the stuff that cotton, wood and a thousand other useful substances are made of, was materially advanced by a paper presented at the meeting of the American Chemical Society in Memphis by Dr. W. T. Haskins, Dr. Raymond M. Hann and Dr. C. S. Hudson of the National Institute of Health.

For the first time in the history of chemistry, the fundamental building block of cellulose, a compound known as cellobiose, was made synthetically by the three researchers. This does not mean that cotton plants, trees and all other sources of cellulose will presently be out of a job, Dr. Hudson stated in discussing the paper. Man will probably never be able to make cellulose as easily and cheaply as plants. But it does mean that science will have a better knowledge of how cellulose is put together, that knowledge can be turned to advantage in making such things as explosives, rayon, plastics and transparent wrappings, of better quality and at lower cost.

When cellulose was first analyzed, more than a hundred years ago, it broke down into molecules of common glucose. Subsequently it was found that these were united in pairs to make double-sized molecules of a more complex sugar which was named cellobiose. Now for the first time it has been possible to make cellobiose artificially and to demonstrate that in the synthetic molecules the glucoses are tied together in exactly the same way that they are in the natural molecules.

At the same session, what might be termed the engineering properties of the cellulose molecule were discussed by Dr. R. F. Nickerson of the Mellon Insti-