

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."

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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."

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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.

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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 to-

gether, 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-

tute of Industrial Research, Pittsburgh. The microscopically fine cellulose fiber of cotton, wood pulp or other natural material is built of long, slender molecules, more or less aggregated into crystals, together with a high content of linked oxygen-hydrogen atoms. Cellulose molecules are not kinked as are wool and rubber molecules, which ac-

counts for the lower degree of stretchiness and bounce to be found in cotton and similar materials. Understanding of these submicroscopic structural details is important in present day efforts to find suitable cotton or other substitutes for hemp, silk, nylon and other "war-short" fibers.

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MEDICINE

Early Cancer Diagnosis With Electrical Test 85% Accurate

Cancers of the Stomach Distinguished from Ulcers By Measuring Potential Differences Across Membranes

DISCOVERY of an electrical test that may become the long-sought means of diagnosing stomach cancer in an early, curable stage was revealed for the first time when the National Advisory Cancer Council approved a grant of \$2,400 for further study of the test.

The test has been developed by Dr. Edmund N. Goodman, but the grant was made for continuing work on it under the supervision of Dr. Allen O. Whipple, of Columbia University, be-

cause Dr. Goodman is now in military service.

So far the test has been 85% consistent in distinguishing between cancer and ulcer of the stomach. The earlier the cancer, the more accurate the test. It has been used in only about 150 cases and Cancer Council authorities caution against expecting too much from it at present.

The test is made by measuring electrical potential differences across human

stomach membranes when milk is in the stomach. Dr. Goodman, an American, working with Dr. Gilbert Adair and Dr. John Ryle in the Cambridge University laboratories of Sir Joseph Barcroft, had previously discovered a constant change in electrical potential across human stomach membranes when milk was in the stomach. Further investigations along this line led to the cancer test just reported.

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PSYCHOLOGY

Beauty of Music Depends On Notes, Not Just Taste

SCIENTIFIC evidence that what we treasure as beautiful or good is decided by something more than irrational whim or prejudice was cited by Dr. Carroll C. Pratt, of Rutgers University, before the Second American Congress for Aesthetics in Washington, D. C.

Results of experiments reported by Dr. Pratt are opposed to the Nazi doctrine that there is no logic, no objectivity, no fact anywhere in the realm of value, he said.

"Pseudo-philosophers like Rosenberg (Nazi spokesman) insist," said Dr. Pratt, "that the way of life chosen by any people is merely the result of irrational wish and fortuitous circumstance. The only method to defend one's way of life is therefore to fight for it—to pull the trigger first."

The evidence in conflict with such a doctrine was found by Dr. Pratt in the field of music. Such qualities as stateliness, melancholy, wistfulness, gaiety, and agitation, he said, have been found experimentally to be intrinsic properties of the tone patterns themselves, not fanciful projections on the part of the listener. "The listener may supplement the sounds with all sorts of unpredictable associations and emotional fillings, but if he has ears to hear, the basic musical qualities are still there in the sounds themselves, just as pitch and loudness are there."

Great works of music are so complex, Dr. Pratt said, that the ear is forced to listen selectively and what one person hears may not be the same as what another person hears. But when methods were devised to insure that different listeners paid attention to the same thing, disagreement about the beauty dropped almost to the vanishing point.

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Cockroaches have been on earth at least 250 million years.



GREAT TRANSPORT

The Douglas C-54 is a commercial plane improved and converted to Army transport use. This four-engine plane will carry 50 armed men, the manufacturer says. On the front cover of this week's SCIENCE NEWS LETTER is another Douglas plane, the Navy's Dauntless, shown in a dive as it must have looked to many a Japanese.