

CHEMISTRY

Artificial Metals Made

Synthetic metals made from non-metals could help materially in the understanding of the properties of metals and the production of improved metals and alloys.

► **NEW ARTIFICIAL METALS** made by applying very high pressures to non-metals are now being produced in laboratory experiments, Dr. W. F. Libby, Nobelist and director of the University of California at Los Angeles Institute for Geophysics and Planetary Physics, reported in Cloudcroft, N. Mex.

He said the synthetic metals show "great promise" for giving man far better understanding of how and why materials react as they do, leading the way to production of improved metals and alloys.

The artificial metals are made by applying very high pressures to the non-metals, then immersing them quickly in liquid nitrogen at a temperature of minus 320.5 degrees F.

Boron nitride, Dr. Libby predicted, can be made into a substance much harder than diamonds.

High pressures can also be used to cook foods at room temperature, Dr. Libby told the Tenth Air Force Office of Scientific Research meeting. Pressures ten thousand times that of ordinary atmosphere cooked egg white in five minutes. It tasted very much like ordinary cooked egg white, Dr. Libby said. Egg yolk has also been cooked in this way.

Hamburger cooked under the same pres-

sure for ten minutes tasted well-done, but did not taste like regular cooked meat.

Dr. Libby predicted that using pressures of one million times the atmosphere, though not now possible, "would open up a whole new world of chemical and physical phenomena."

• Science News Letter, 88:5 July 3, 1965

TECHNOLOGY

Ceramics Are Finding Wide Variety of Uses

► **CERAMICS**, once used to make only pottery and brick, have now found important Space Age applications in everything from spaceships to computers.

Heat resistance, super strength and comparative light weight allow ceramic materials to serve as heat shields in space vehicles, in oceanographic vessels or in kitchenware with equal success. Their electronic insulating properties make them vitally necessary for capacitors, transistors and many more parts for television, radio, computers and other electronic devices, reported Dr. Elburt Osborn, Pennsylvania State University, University Park.

"The field of ceramics is more important

in our national effort than most of us probably realize," Dr. Osborn told a meeting of the American Ceramic Society in Philadelphia. He is outgoing president of the group.

Metals are reaching a plateau as far as structural strength is concerned, and plastics and organic materials are also reaching their limit of strength, he said. However, the theoretical strength-to-weight ratio of ceramics has not been approached. Newer, stronger and more versatile ceramics are being developed each year, and the earth, the source of ceramics, is inexhaustible.

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Columbia University

PARIS BOUND—Dr. M. D. Hassialis, head of Columbia University School of Mines, examines specimens from the collection of prize North American minerals he assembled. These rocks are a gift to the French mining school, L'Ecole des Mines, where Thomas Egleston Jr., founder of the 100-year-old Columbia school, received his mining education.

TECHNOLOGY

New Spacecraft Material Is Light and Strong

► **MATERIALS** that provide the strength of steel at half the weight are being developed in response to the growing need for very strong, light-weight rocket motor cases and other types of pressure vessels.

Composite materials, high strength filaments such as glass, boron and metals bonded together with low strength resins, will tolerate bullet holes or shrapnel tears because the loads are distributed over the remaining undamaged filament material so that the tear or puncture does not extend beyond the original damage. The new materials are resistant to corrosion or fungus deterioration.

The Lockheed-California Company is studying these materials with a view to their use in aircraft, spacecraft and undersea vessel manufacture.

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ASTROPHYSICS

Seek Origin of Universe

► **A NEW METHOD** is now in use for looking at the structure of the universe that will help tell whether the cosmos began with a "big bang" (see SNL 87:403, June 26, 1965) or whether it is in a steady state with matter being continuously created between stars.

The technique, called the scintillation method, is a way of measuring the changes in radio waves sent out by far-distant objects, some at the edge of space.

Use of the new technique, which began just this year at Arecibo Ionospheric Observatory, was reported in Cloudcroft, N. Mex., by Dr. Thomas Gold, director of Cornell University's Center for Radio Physics and Space Research. The "very sensitive" method is so new that only preliminary results are available, he told the 10th Anniversary Air Force Office of Scientific Research seminar.

The technique is based on the changes in radio waves from the far-away sources, caused by slight variations in the number of particles being continually blown spaceward by the sun. This solar wind shows small differences in electron density when near earth and these changes can be detected

with a giant 1,000-foot antenna at Arecibo, Puerto Rico, when it is tuned in on radio waves from the heavens at 200 megacycles.

The technique can be likened to the way the eye distinguishes planets from twinkling stars—planets do not twinkle, stars do. Dr. A. G. Hewish, Cambridge, England, discovered the scintillation method, now being pursued at Arecibo by Dr. Frank Drake and M. Cohen.

By measuring the twinkling of radio sources due to the solar wind, these scientists are determining the "scintillation index" of radio sources.

When enough data have been collected, they will show whether nearby space is like that at the edge of the observable universe, or whether it differs considerably.

If the cosmos is alike throughout, it is in a steady state.

If it differs as observations go farther out in space and therefore farther back in time, large-scale evolution is taking place and the universe probably began with a "big bang."

"It will take five or six years of observations to tell," Dr. Gold said.

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