

Nature Note

Copper

► THE ELEMENT copper was probably the first metal used by man, nearly 10,000 years ago.

In its "pure" untarnished state, copper is pink in color. It soon turns a reddish-brown color when exposed to air, as copper molecules on the surface combine with oxygen molecules of the air to form a thin protective coating called an oxide.

Copper is very malleable, which means it can be rolled or hammered into different shapes or thin sheets. It is also very ductile, which means it can be drawn out into a fine wire without breaking. Its melting point is over 1,000 degrees C. Next to silver, copper is the best conductor of electricity and heat. That's why it is used so extensively today in telephone, telegraph and power lines, as well as radios, television sets and other electrical equipment. Copper's ability to resist corrosion has made it useful for roofing and screens, and its natural beauty has inspired man to make many ornaments, statues and other decorations.

Copper was "discovered" and used first by Neolithic man during the late Stone Age, about 8000 B.C. At that time, copper was probably so abundant in its free state that our ancient ancestors could pick it up in nuggets from the earth's surface. By pounding and hammering the metal, man could shape it into crude hammers, knives and other utensils.

About 2,000 years later, evolving man discovered he could melt the metal over a campfire and cast it into shape. When he first began reducing copper ore to copper over the fire, the "Dawn of the Metal Age" and the birth of metallurgy began. The Egyptians became great craftsmen of copper as early as 5000 B.C. By 3000 B.C. copper was produced extensively on the island of Cyprus. The Romans called the material *aes cyprum* (ore of Cyprus) which was shortened to cyprum and later to cuprum, from which comes the English name copper. The chemical symbol Cu is taken from the first two letters of the Latin name.

Copper in nature occurs widely distributed and in many unusual places. It is found in rocks and soils, as well as in seaweeds and other plants. It is in the human liver and in many snails and spiders. Copper is also reported in many corals of the sea.

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METEOROLOGY

Geodetic Institute 'Taps' U.S. Weather Satellites

► A METHOD for receiving and reproducing pictures from U.S. weather satellites Nimbus II and Tiros has been developed by a team of researchers at the Geodetic Institute at the university of Uppsala, Sweden.

Some 300 pictures have been received, studied and stored on magnetic tape, since the work started on the project last March.

When the satellites are within reach, an antenna and a receiver catch the signals, which are then reinforced and transmitted to a telephoto machine for satellite pictures. In 200 seconds the machine receives, exposes, develops and dries an individual 160x160 mm picture.

At the same time as the pictures pass through this procedure they are recorded on a magnetic tape for filing. The entire procedure is started automatically by the satellites' own three-second starter signal.

Each satellite picture covers an area of some 1,400x1,400 miles of the earth's surface or more than the whole of Scandinavia while it gives a clear indication of cloud formations.

The observing of satellites at the Geodetic Institute has primarily been aimed at studying the shape of the earth and the composition of the atmosphere.

SURGERY

Closed Circuit Color TV Beams Vivid Surgery Pix

► A CLOSED CIRCUIT television system that will bring vivid color pictures of surgical operations simultaneously to hundreds of doctors and students has been developed.

The only other system like it in the United States is being used by National Aeronautics and Space Administration scientists to study the true color of rocket exhausts.

Standard color TV does not reproduce color in small areas accurately enough to be of value in many phases of medical education. Close-ups of veins in the heart, for example, cannot be obtained. The standard models are poorest in reproducing red and blue, the essential colors for medical use of color TV.

The new system was developed at the bioelectronics laboratory at the State

University of New York Upstate Medical Center, Syracuse. The pictures reproduced by the system have more than 300 lines resolution in any color, William Mueller, the laboratory's director, said. A standard color set has approximately 200 lines of green and 40 lines of red or blue.

The system was first demonstrated publicly on a trial basis for 80 physicians from all over the country at a postgraduate medical course sponsored by the American College of Physicians.

The physicians saw open-chest demonstrations of cardiac arrhythmias and heart failure as clearly and as sharply as if they were in an operating room. The heart was projected in vivid color about three or four feet in diameter on the screen. Even a hair that accidentally fell into the open chest cavity was visible to everyone in the room.

OCEANOGRAPHY

Environmental Sampler To Help Undersea Study

► A DEEP OCEAN environmental sampler developed by four Naval Research Laboratory scientists is capable of taking samples not only at great water depths, but in any liquid and fluid environment of extreme pressure.

The sampler will permit scientists to study mud and water at the same temperature and pressure as they are found in their natural state. Sea water samplers now in use cannot hold a sample at the temperature and pressure at which the sample is taken.

The device is essentially two coaxial cylinders with an internal double-ended piston rod. The water sample is captured between the two pistons as it slides into the cylinders under gravitational or spring loading.

The sampler will be used to determine whether samples of mud and water are altered by depressurization as they are raised to the surface.

A patent for the invention has been issued to Chester L. Buchanan, Jervis J. Gennari, Howard E. Barnes and Walter L. Brundage, Jr.

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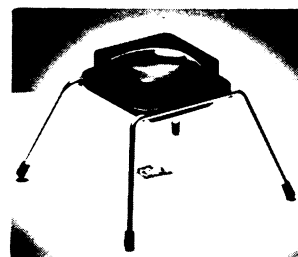


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