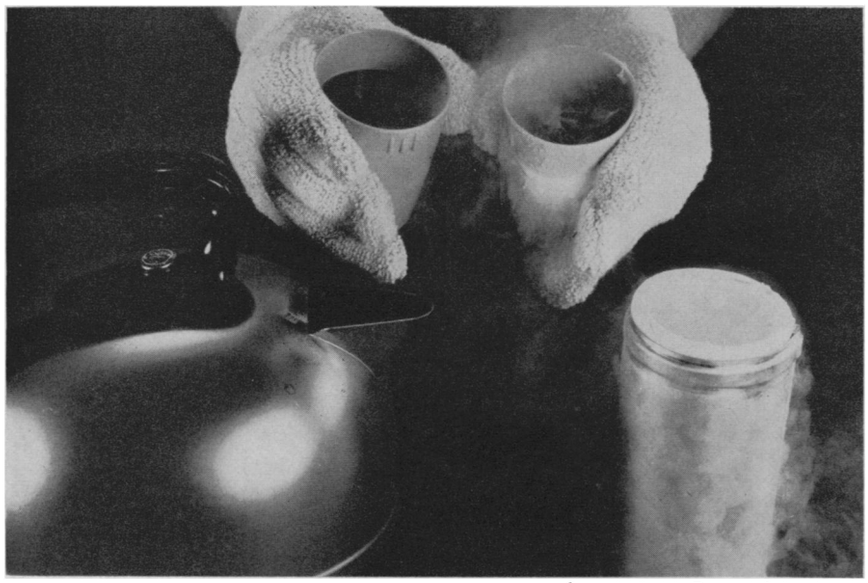

General Electric Research Laboratory

PLASTIC PROGRESS—Drinking cups made of General Electric's new plastic PPO polymer remain extremely strong and "squeezable", not only when filled with boiling water (212 degrees Fahrenheit), as shown in the cup on the left, but also when filled with liquid nitrogen (320 degrees below zero Fahrenheit), at right

CHEMISTRY

New Family of Plastics

➤ A NEW FAMILY of plastic materials that promises to have the same impact as nylon had 30 years ago has been discovered by a scientist at General Electric Research Laboratory, Schenectady, N.Y.

The basically different method for making plastics was found by Dr. Allan S. Hay, a 35-year-old research chemist using a technique called "polymerization by oxidative coupling." The first product to be put on the market in the new family of polymers will be called "PFO," for polyphene oxide.

Oxygen from ordinary air plays a key role in making PPO and other plastics by the new method. PPO will eventually replace copper for hot water and steam pipes in homes and factories, a GE official predicted.

The company is backing its faith in the new plastics with plans for large-scale production and formation of a new company in The Netherlands to introduce the process in Europe. Pilot plant quantities of PPO are now being produced at Pittsfield, Mass., and will be available after Jan. 1 at $1.50 per pound.

PPO is the first of a wide variety of plastic materials that can be made by Dr. Hay's polymerization technique. It is a molding compound derived from 2,6-xylenol and has high strength and durability.

Dr. Guy Suits, a GE vice president and director of research, said that oxidation coupling yields new plastics that will eventually replace traditional structural materials in a very large number of applications.

They can be specificially tailored for any required job, he said, and have good physical properties at temperatures 150 degrees above that of boiling water. PPO can be molded in conventional equipment, machined like brass, and squeezed into rods, slabs, sheets and pipe.

Surgical instruments constructed of PPO have already been made for the U.S. Army. They are not only strong, lightweight and sterilizable, but can be coded by color to make identification easy.

A piece of PPO rod simultaneously withstood both boiling water and temperatures of 320 degrees below zero Fahrenheit in a demonstration.

In addition to outstanding mechanical strength and usefulness in a wide temperature range, PPO also boasts excellent dimensional stability, low density, and excellent properties for electrical and electronic use.

Other applications include insulation for extra-high-voltage transmission lines, battery cases and appliance parts.

• Science News Letter, 86:378 December 12, 1964

GEOPHYSICS

Mountain Range Found Under Indian Ocean

➤ A NEW UNDERWATER range, a 1,500-mile long ridge extending from the coast of Pakistan to almost the Equator near the African east coast has been discovered in the Indian ocean.

It has been provisionally called the "Owen Fracture Zone" after the 1,600-ton ship, Owen, from which measurements of the ocean's depth, gravity and magnetic strength were made.

• Science News Letter, 86:378 December 12, 1964

TECHNOLOGY

Microscope Uses Beam To Map Tiny Areas

➤ A NEW ELECTRON microscope can take pictures of surface areas smaller than a thousandth of a square inch by scanning them with a fine electron beam.

The scanning microscope, which is being used at Westinghouse Research Laboratories, Pittsburgh, to study the structural and electrical performance of microelectronic devices, works somewhat like a closed-circuit TV system.

A camera is located inside the instrument with a display tube outside for viewing. Pictures are flashed on the tube at magnifications as high as 10,000 times or about 10 times better than with conventional optical microscopes.

• Science News Letter, 86:378 December 12, 1964

BIOCHEMISTRY

Acid-Alkaline Balance Important to Health

➤ DISEASE UPSETS the acid-alkaline balance of the body, and biological scientists have accurate methods for testing the acidity of blood, urine, gastric juice and other body fluids.

Present-day chemical tests of blood used to distinguish between respiratory acidosis and metabolic acidosis, however, are not accurate when respiratory acidosis is severe, Dr. E. B. Brown of the University of Kansas Medical Center, Kansas City, Kans., told a conference on current concepts of acid-base measurements. The conference was sponsored by the New York Academy of Sciences in New York.

Respiratory acidosis is the result of too much carbon dioxide in the blood. Carbon dioxide reacts with the blood water to form carbonic acid, and acid intoxication, or acidosis, occurs when the lungs cannot transfer the carbon dioxide from the blood to the expired air. This happens when the lungs are diseased, or the respiratory muscles are paralyzed, or the respiratory center in the brain is not functioning properly.

Metabolic acidosis occurs in diabetes when too much organic acid is formed. This is normally changed to carbon dioxide and water, then eliminated by the lungs. Metabolic acidosis also occurs in serious kidney disease because the diseased kidneys cannot eliminate certain acids normally found in the body when proteins are broken down.

The inaccurate blood tests, Dr. Brown said, give different results when done in the living animal than when done on the blood.

In the living animal, some of the bicarbonate, formed by the action of carbon dioxide on blood buffers, moves into other body fluids. Therefore, tests performed on blood alone, in the presence of severe respiratory acidosis, tend also to suggest a severe metabolic acidosis even when this is not the case.

• Science News Letter, 86:378 December 12, 1964