

## CHEMISTRY

# Make Heavy Elements

IN ONE OF the giant atomic reactors at Savannah River, S. C., about a pint, 12 kilograms, of plutonium, fission bomb element, is being bombarded with neutrons.

Some years hence chemists will extract the world's largest quantity of the extremely rare man-made chemical element californium, number 98, a matter of only a milligram, about one thirty-thousandth of an ounce.

This will be a major step toward understanding and possibly using the heaviest known elements that can be converted in a step by step process of successive transmutation into heavier elements.

This promises also to lead to the creation of still-undiscovered element 103 and still heavier elements.

Dr. Glenn T. Seaborg, Nobelist, discoverer of many of the transuranium elements of the atomic age, who is now chancellor of the University of California, Berkeley, described the new long-range national program to produce research quantities of synthetic elements 97, 98 and 99 in receiving the Dickinson College 1960 Priestly Memorial Award.

Dr. Seaborg proposed at the same time that the new program be expanded into an international effort at the U. N.'s International Atomic Energy Agency in Vienna, with scientists from other nations, including Russia, to participate.

About 100 grams, three ounces, of curium, element 96, will be produced by 1963 in the first step, along with other heavy elements.

By that time, the University of California is expected to have a high flux neutron reactor, part of the current proposed program

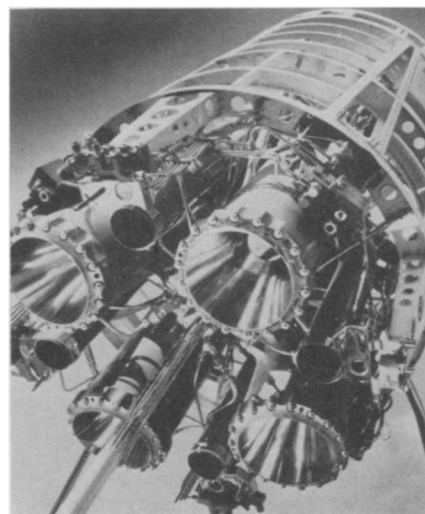
of the Atomic Energy Commission. The curium, much more than ever produced before, will be subjected to the extremely high concentration of neutrons that will be created in the new reactor. At the end of two or three more years further transmutations will have occurred, and there will be extracted about a milligram of californium.

A milligram of californium will be many times more than scientists have ever been able to assemble. It will be a treasure worth millions of dollars and have intangible value beyond price. Part of it will be used, for example, as a target material in atom-smashers like the Berkeley HILAC, in which Dr. Albert Ghiorso, of the Lawrence Radiation Laboratory, would attempt to create element 103.

Out of the discovery of such new elements and chemical and other studies of the properties of the extremely heavy nuclei will come refinements of knowledge of the heavy atomic nuclei the value of which cannot be calculated.

In proposing that the program be made international, Dr. Seaborg said: "The program meets all the criteria for international development. There is nothing more basic or more international than the chemical elements. They are the elementary stuff of the universe. These heavy ones have no military value. Making the heavy ones is extremely expensive. If we can include scientists from other countries in the program, and provide them with some of the materials we will make a valuable contribution to the expansion of human knowledge and international understanding."

Science News Letter, April 2, 1960



**BLACK KNIGHT ENGINE**—A Bristol Siddeley Gamma Mk 201 rocket engine powers the British re-entry vehicle, the Black Knight. It burns hydrogen peroxide and kerosene and weighs 700 pounds. It has been successfully tested at altitudes of 250-500 miles in Woomera, Australia.

## TECHNOLOGY

## Diamonds May Prove Doctors' Best Friend

DIAMONDS, a girl's best friend already, will find new friends in industry and medicine if a high-voltage electron accelerator pays off for the Diamond Research Laboratory in Johannesburg, South Africa. Researchers will study diamonds' potential uses in supersensitive thermometers, as transistors and as tiny probes for tracing radioactive matter.

Some diamonds are semi-conductors with electrical resistances that vary with slight temperature changes. Bombardment with electrons may change some diamond characteristics.

Science News Letter, April 2, 1960

## FOOD TECHNOLOGY

## Algae Bank Gets Funds For Next Five Years

### See Front Cover

AN ALGAE "BANK" of more than 800 strains, studied as a possible food to meet the threat of over-population, will be supported by a grant of \$34,600 for the next five years from the National Science Foundation.

Prof. Richard C. Starr, Indiana University botanist, is seen with part of the bank on the cover of this week's SCIENCE NEWS LETTER.

The algae are grown in glass tubes in a constant temperature under continuous fluorescent lighting. They are studied as a food and used in genetics research. They may possibly be grown on future space flights as food for space travelers.

Science News Letter, April 2, 1960

## ANTHROPOLOGY

# Cold Indians Keep Warm

INDIANS living at the tip of South America have higher basal metabolism and body temperatures than whites.

Nine physiologists and anthropologists, led by Dr. H. T. Hammel of the University of Pennsylvania School of Medicine, Philadelphia, tested responses to cold exposure of the Alacaluf Indians on Wellington Island off southern Chile.

In tests, adult male Indians slept in single-layer blanket bags in unheated tents at temperatures between 32 degrees and 41 degrees Fahrenheit.

While the subjects slept, oxygen consumption, carbon dioxide production and body temperatures were measured to obtain the metabolic rate and to show how their skin conducts heat. Their metabolic rate is generally high, and it increased further when shivering occurred.

The Alacaluf Indians were observed by Darwin who reported in 1832 that they wore few clothes of skin and often were seen in their daily activities without clothes. He writes that a "woman, who was suckling a recently born child, came one day along-

side the vessel . . . whilst the sleet fell and thawed on her naked bosom, and on the skin of her naked child."

However, Dr. Hammel's report in the second issue of a new journal, *Current Anthropology*, 1:146, 1960, holds that these Indians are not exposed to cold for long periods.

They live in huts made of saplings and covered with seal or other skin. Although the wind blows freely through the huts, a fire is maintained in the center of the hut, and the Indians sleep between skins with their dogs gathered around them for added warmth.

During the day, the Alacalufs usually expose only their arms and legs to the cold. Their extremities are rarely covered although today the men will sometimes wear cast-off shoes obtained from sailors. They generally search for food and fuel with a canoe, but the women and children often wade in the cold waters of the shore to find mussels, clams and sea urchins for food.

Science News Letter, April 2, 1960