

Next in the transactinides

The manufacture of new manmade elements has been a continuing activity of the Lawrence Radiation Laboratory at Berkeley Calif., since the discovery of neptunium, element 93, in 1940. The laboratory has had a part in the discovery of every known element heavier than uranium, the heaviest naturally occurring one.

Last year a team headed by Dr. Albert Ghiorso reported discovering element 104 (SN: 4/26/69, p. 398). This year the same researchers report element 105. Other members of the group are Drs. Matti Nurmi, Kari A. Y. Eskola, James A. Harris and Mrs. Pirko L. Eskola.

Assuming the prerogatives of the discoverers of a new element, Dr. Ghiorso told the meeting of the American Physical Society in Washington, D.C., this week, he and his colleagues propose to call the new element hahnium after the late Dr. Otto Hahn, the discoverer of nuclear fission. The particular isotope they have been dealing with is hahnium 260.

The isotope they determined, has a half-life of 1.6 seconds, much longer than the millisecond lifetimes that would have been expected from experience with other transuranic elements.

"The combination of half-life and alpha particle energy (9.1-million-electron volts) distinguishes 105 from all other isotopes and elements in the periodic chart of the elements," says Dr. Glenn T. Seaborg, Chairman of the Atomic Energy Commission and a founder of the Berkeley group. "This is the second step into the relatively unexplored region of the periodic system I have chosen to call the transactinide elements."

Element 103 had completed the so-called actinide series of the periodic table of the elements. Elements 104 and 105 are the two first steps into an entirely new section of the periodic table with different chemical and physical properties than those that have gone before.

In contrast to some other discoveries of transuranic elements, which were based on a handful of positive identifications, this experiment has produced hundreds of atoms of element 105 since the first were seen on March 5. Six atoms were made during each hour of experimentation.

The method for producing element 105 is an improved version of the system used to produce element 104. It begins with the bombardment of a target of californium 249 with a beam of nitrogen nuclei accelerated in the

laboratory's Heavy Ion Linear Accelerator.

The target was in a chamber in which a current of helium gas was blowing. When a californium nucleus absorbed a nitrogen nucleus to make a nucleus of element 105, the 105 nucleus came loose from the target and was swept from the chamber by the helium current. It immediately struck and stuck to the rim of a magnesium wheel. The wheel was rotated at predetermined intervals to place the element 105 opposite arrangements of detectors located in five different places.

Element 105 was directly detected by its own radioactive decay process without being separated from other elements produced in the bombardment. In the decay element 105 gives off alpha particles and turns itself to lawrencium 256. The energy of the alpha particles,

9.1-million-electron volts, distinguished them from alpha particles produced in the decay of any other element.

The lawrencium produced in the decay of element 105 was ejected from the wheel in the process and decayed radioactively in its turn. The sophistication of the experiment was such that the time interval between the appearance of the 9.1-million-electron-volt alpha particles and the appearance of the decay products of lawrencium could be measured.

The number of alpha particles and lawrencium decays matched, and the alpha particles always came before the lawrencium decays. This is taken as evidence that the lawrencium is indeed a decay product of element 105 and not lawrencium that floated in from somewhere. The relationship is being taken as verification of the find. □

HEALTH INSURANCE

Band-Aids and major surgery

Health-care costs have mushroomed to such an extent that the possibility of national health insurance for all citizens is being taken more and more seriously. In Congress a spate of such cradle-to-grave proposals have been introduced (SN: 2/14, p. 170). The latest is from Sen. Jacob K. Javits (R-N.Y.), who says his bill would relieve the drain on the private pocketbook while encouraging more rational methods of health-care delivery.

Under the bill, health benefits generally similar to those under Medicare would be extended to all by 1973. Preventive medicine would be stressed through the bill's provision of assistance toward an individual annual physical checkup.

Introduction is far from adoption, or even broad acceptance of the idea. The Administration is backing proposals to work within existing Federal health programs—proposals that critics claim are mere Band-Aids on gaping wounds in the health-care system. According to Tom Joe, assistant to the Under Secretary of Health, Education and Welfare, there is at present no Administration inclination to extend Federal coverage to additional groups of people.

"We should get the bugs out of the existing system first," he says. "After all, we are already covering 12 million poor and 20 million aged. It's high time we used what we already have in the private sector to create a better delivery system." He suggests that areas of improvement could be in group practice, team concepts and closer investigation by insurance companies of the quality of the health care they are underwriting.

In the light of this philosophy, pros-

pects seem dim for passage of national health insurance legislation in the foreseeable future. Congressional advocates of the measures concede the point, but also emphasize the flood of letters Congressmen have been receiving complaining about health care. The bills have been placed in the hopper, they say, as a means of spotlighting the broader problem that must be faced soon. □

ESTROGENS

Enough to move FDA

That estrogen in birth control pills has a direct relation to bloodclotting in the legs, lungs and brain has previously been established. But no studies to date have been conclusive enough to warrant action by the Food and Drug Administration.

A report of British medical researchers, published in the current issue of the *BRITISH MEDICAL JOURNAL*, has changed all this. It confirms for the first time that the dose of estrogen is related to occurrence of thromboembolytic or bloodclotting disease, including heart attack. Not only is the size of the dose a factor; the kind of estrogen appears to be as well.

As a result, the FDA this week recommended to physicians that they prescribe brands of birth control pills containing the lowest dose of estrogens necessary to prevent conception.

The researchers, headed by Drs. W. H. W. Inman and M. P. Vessey of the British Committee on Safety of Drugs, report that pills containing up to 100 micrograms of estrogen cause two to three times the number of thromboembolytic episodes as those with 50