

## 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

micrograms. The physicians compared all birth control pills on the market containing different amounts of estrogen to determine the relationship between the hormone and clotting episodes. From reports of 920 physicians in Britain and 305 in Sweden and Denmark, between 1965 and 1969, they concluded that estrogen is a major factor in thromboembolytic disease.

As a result of the study, the British committee in December advised women there to avoid brands containing more than 50 micrograms of estrogen. In the United States FDA Commissioner Charles C. Edwards and other officials examined the British reports but took no action until the full report was published. Dr. John Jennings, Edwards's aide for medical affairs, said then that the data were not derived from scientifically controlled studies and were severely limited because there was no control group.

But on reviewing the latest report, Dr. Jennings and his boss changed their minds; they now agree that the findings are apparently valid, within the limits of the study, and that the warning ought to be issued.

There is still some uncertainty, however. A complicating factor, says Dr. Edwards, is the role that progestogens play.

Progestogens are also known to produce estrus—the active component of estrogens—but according to Dr. George Langmuire, Medical Director of Planned Parenthood World Population, it is not clear in terms of the study what the relationship is. "Certainly more studies with progestogens are indicated before concrete decisions can be made," he says.

Of the estimated 8.5 million users of oral contraceptives in the United States, about half use the lower-dose, 50-microgram pills. Most others use brands containing up to 60 and 100 micrograms. But women on the sequential program, where estrogen is taken during the menstrual cycle and a combination of estrogen-progestogen taken during the remainder of the period, take pills containing from 80 to 100 micrograms.

Commissioner Edwards cautioned physicians that when prescribing they should take into account the fact that different forms of estrogen have different potencies. Specifically, 50 micrograms of one estrogen, ethinyl estradiol, is equal in potency to 75 or 80 micrograms of mestranol, another estrogen.

Some American brands containing 50 micrograms of estrogen include Ortho-Novum and Norinyl (mestranol) and Norlestrin (ethinyl estradiol). Brands with over 50 micrograms include Enovid, C-Quens and Ovulen (mestranol) and Oracon (thinyl estradiol). □

NASA

## Budgets and clues

The National Aeronautics and Space Administration, absorbed in a time-consuming investigation of the Apollo 13 abort, is also juggling the lowest budget allocations in 17 years (SN: 3/14, p. 264). Last week the agency received a small shot in the arm when the House of Representatives voted 229 to 105 to authorize \$3.6 billion for the 1971 budget.

The House debate, delayed for a week by the abort (SN: 4/25, p. 407), resulted in a cut of only \$30 million from the \$3.63 billion authorization bill submitted to the House by the Science and Astronautics Committee. The cut was in money for the Apollo program and Space Flight Operations Research and Development, but the over-all budget topped President Nixon's request by \$268 million.

Space officials refused to be too optimistic, however. The Senate's Aeronautical and Space Sciences Committee will submit for debate a bill that cuts the \$3.33 billion Nixon request by \$17 million in Research and Program Management and facility construction funds. After Senate action, expected this month, a compromise must be reached between the House and Senate versions, which differ in authorization by \$285 million.

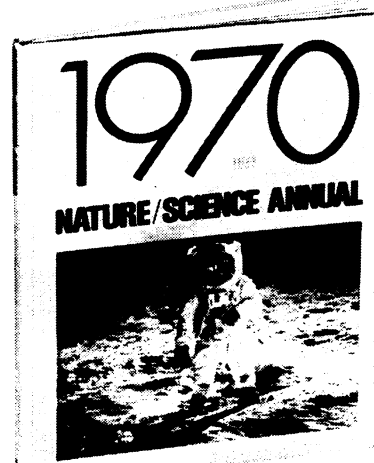
The money struggle has shifted now to the House Appropriations Committee, which allocates—or deletes—the funds for the programs approved in the authorizing legislation.

The boost in funds came at a time when the investigation into the causes of the Apollo 13 accident is making round-the-clock progress. In testimony before the Senate space committee last week, NASA Administrator Dr. Thomas Paine, Rocco Petrone, Apollo program director, and Astronauts James Lovell and John L. Swigert reviewed the events before and after the accident.

**Meteorite impact** has been eliminated as a cause for the oxygen tank eruption. Study of the telemetry data has narrowed the problem down to a component failure within the tank itself. This could have caused the rapid rise in pressure that preceded the explosion.

None of the energy sources—electrical or kinetic—associated with the tank could generate enough heat to account for this rise in pressure, so another energy source must be found. Such a buildup could stem from an electrical short circuit in the system, which would in turn cause the high currents spurts and lead to overheating, pressure rise and subsequent eruption. A short is considered the best bet yet. □

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