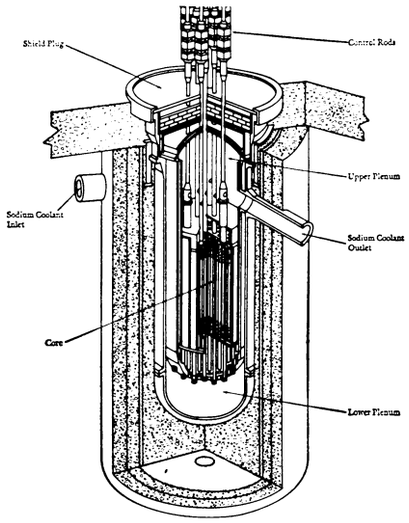
FAST BREEDERS

AEC: Commitments to come

At the end of 1965, less than one percent of the nation's electric power came from nuclear power plants. That was sufficient, however, to show nuclear power to be competitive with coal- and oil-fueled plants. Consequently, during 1966 more than half of the country's newly ordered electric capacity was nuclear, and the proportion decreased only slightly in 1967.

The trend towards nuclear power is so strong now that the Atomic Energy Commission and industry predict that



Westinghouse Electric Co.

Cutaway of prototype fast breeder.

by 1980 nuclear power will produce between a fifth and a quarter of the country's projected total electric power capacity of 500,000 megawatts.

Unfortunately, the expansion in nuclear power could eat up the country's supply of low-cost uranium by 1990.

The problem is that light water reactors in present nuclear power plants use uranium inefficiently, burning less than one percent of the mined uranium. The solution is a fast breeder reactor, now being developed, that uses about 70 percent of the mined uranium by converting it under neutron bombardment to fissionable plutonium.

So great is the potential of the fast breeder reactor for reducing costs and preserving uranium that an all-out effort to speed its commercial development was repeatedly called for at the World Energy Conference held in Moscow this summer.

To insure that the United States develops a fast breeder reactor in time to meet world competition (see p. 328), the Atomic Energy Commission has issued a 10-volume master plan calling for the development of a commercial fast breeder power plant by the 1980's. The AEC plan spells out what needs to be done and establishes priorities for doing it.

The plan calls for the AEC to get a commitment in 1970 from a reactor manufacturer and a utility, or group of utilities, for the construction of a demonstration plant of about 300-megawatt size. The plant would cost between $60 million and $100 million to construct, with an equal amount going to research and development needed to design the plant. Under its new plan, the AEC, with Congressional approval, would put up some $80 million for the research and development. A total of three demonstration plants spaced out over two-year intervals would receive AEC support.

Based on the technology developed in the demonstration plants, the AEC plans to build a commercial plant of about 1,000 mw in the late 1980's. The total endeavor, according to AEC estimates, will cost over $1 billion in Federal and private funds.

According to the AEC, the technical feasibility of the concept has already been established. However, there are numerous technical problems that must be overcome before a commercial plant can be built, including safety, high plant reliability, and economic fuel cycle.

Safety is the AEC's first consideration. Its goal as stated in the plan is to enable the designer of a commercial plant to "demonstrate that the probability of any major accident is very small and that minor accidents and mishaps cannot snowball into a major occurrence." A normal problem with any pioneering nuclear facility, safety is especially a problem with the breeder reactors. (SN: 8/26/67, p. 200).

Operating reliability of the reactor and the remainder of the power plant must be high. The AEC plan says the plant must be "available for operation 80-90 percent of the time." This again can only be assured by actual operating experience.

An economic fuel cycle has to do with the doubling time of plutonium—the time it takes the fast breeder to produce an amount of fuel equivalent to the amount it began with. Doubling times of 10 years are the maximum that will give fuel-cycle costs that are insensitive to the price of fuel material.

The country's reactor manufacturers and the major utilities have been working on fast breeders for over twenty years. They have already chosen up sides in the competition to build the first demonstration plant. General Electric Co., for example, is teamed up with a group of New York utilities known as ESADA; Westinghouse Electric Corp. is working with 21 electric utilities and Commonwealth Associates. Both groups have done research and development aimed at committing themselves to a 200-400 megawatt demonstration plant in 1970, right in phase with the AEC plan.

These industry teams are eager to get a commercial plant as soon as possible because of foreign competition, and they will no doubt welcome AEC's help.

CROCKS AND CRUDS

Drugs, doctors and detail men

In hearings last week before the Senate Small Business Monopoly Subcommittee, Merck & Co., one of the largest drug houses, was charged with issuing seriously misleading bulletins to its salesmen, or detail men, who advise doctors on prescription drugs and their effects.

"It is obvious that Indocin will work on that whole host of rheumatic crocks and cruds which every doctor sees daily," the salesmen were told to tell the doctors, according to subcommittee testimony. Indocin is a potent anti-arthritis compound known to have serious side effects.

Food and Drug Administration spokesman Robert S. McCleery testified that the cracks about crocks and cruds "reflect disquieting attitudes of the firm's employees toward the medical profession and to the patient."

Just before the hearings began, the Department of Health, Education and Welfare last week charged the nation's drug-makers with:

- Over-pricing.
- Wasting scientific talent (and $500 million-a-year) on me-too or duplicative products.
- Inundating physicians with biased advice about new drugs.

These two latest skirmishes in the Government's running battle with the industry—it has been going on hotly since the Kefauver-Harris hearings in 1962—take on new urgency as Congress debates the inclusion of prescription drugs in Medicare benefits. (The Government already spends $300 million a year on drugs.) Last year action on bills authorizing payment for prescriptions by generic names was delayed, in part, to await the outcome of the HEW investigation of the issue of cost versus quality (SN: 12/9/67, p. 559). The outcome—resounding indictment—seems to point toward generic

prescribing, but the issue is far from settled.

The industry argues that even though brand-name drugs cost more than their generic counterparts, the brand name is a guarantee of quality that justifies the price. And, it insists, generic counterparts may not be counterparts at all; subtle differences in manufacturing processes may affect the way drugs that are chemically identical behave inside the human body (SN: 4/22/67, p. 382).

The Food and Drug Administration, leading clinical pharmacologists and even HEW agree that chemical identity does not always equal clinical equivalency, but, says its Task Force on Prescription Drugs in its second interim report, "the lack of clinical equivalency among chemical equivalents meeting all official standards has been grossly exaggerated as a major hazard to the public health."

Dr. Milton Silverman, head of the task force's professional staff, reports that of a group of 400 drugs commonly prescribed for the elderly, who comprise only 10 percent of the population but 23 percent of the retail drug market, the issue of equivalency is relevant to only a couple of dozen. Roughly 70 percent of the 400 are patented drugs for which there is no generic competitor. The importance of equivalency among the remaining 30 percent, he explains, is limited to those few so-called life-saving drugs, such as potent antibiotics, that come in solid forms—tablets or capsules.

Drugs that are chemically identical are assumed to be clinical equals if the active ingredients reach the blood stream at the same time and in the same amounts. With liquid drugs, this is seldom a problem. But in solids, crystal size, tablet coatings and binding agents affect the rate of dissolution.

To assure high quality in all drugs on the market, HEW endorses ongoing research by the FDA, in association with the National Academy of Sciences and Georgetown University, to measure effectiveness and equivalency of both brand name and generic products. Studies on 1,834 drugs licensed prior to 1962 (when the law began requiring manufacturers to demonstrate effectiveness as well as safety) FDA Commissioner Herbert L. Ley, Jr. says, found 3.5 percent to be totally ineffective, 3 percent were found ineffective in certain combinations and another 6.8 percent are questionable.

"Adequate financial support," the task force states, "should be given to the FDA to tighten control on all drugs in interstate commerce." Neither it nor FDA will spell out "adequate" in dollars.

The department, the report says, should also establish a compendium providing up-to-date information on all drugs (SN: 3/4/67, p. 207). There is at present no such single source for physicians, who therefore rely heavily on promotion and advertising for information.

Because of this, and in spite of firm protests from the American Medical Association, the task force doubts the ability of average practicing physicians to prescribe rationally.

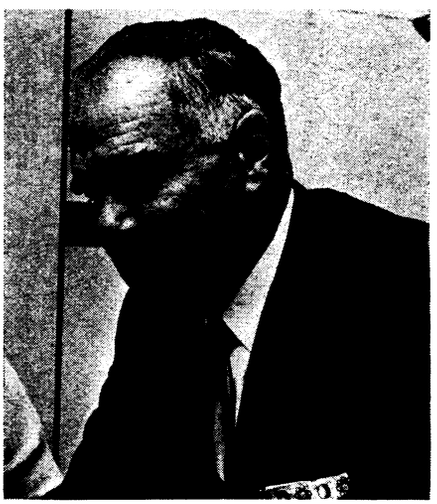
SCIENCE SPOKESMAN

Seaborg wins Arches Award

Dr. Glenn T. Seaborg has been chairman of the U.S. Atomic Energy Commission since 1961.

He won the Nobel Prize in chemistry in 1951 for the discovery of plutonium and his work with other transuranium elements.

He has also been chancellor of the University of California at Berkeley and an associate director of the Lawrence Radiation Laboratory, and is one of science's more prolific proselyters and speechmakers.



Westcott—AEC

Arches of Science: Dr. Seaborg.

It was for these latter activities that Dr. Seaborg will be honored next month when he becomes the fourth winner of the Arches of Science Award —a gold medal and a $25,000 check.

The award, named for the five arches that soar above the Pacific Science Center in Seattle, will be presented in formal ceremonies there on Oct. 16.

In his nuclear research work at the Radiation Laboratory, Dr. Seaborg was the co-discoverer in 1940 of plutonium, element 94, the first of nine transuranium elements—through No. 102—that he and his co-workers synthesized during the next 18 years.

Besides his roles in AEC policy, planing and administration, and in academic research, Dr. Seaborg is deeply involved in interpretation of science activities, such as the development of new methods of teaching and conducting research in chemistry. He also takes an active role in youth programs, including the science fairs and Science Talent Search sponsored by Science Service, of which he is president of the Board of Trustees.

NASA HEAD

Webb out, Paine (maybe) in

Four days before the scheduled first flight of a manned Apollo spacecraft, the head of the National Aeronautics and Space Administration will resign. James E. Webb made public his decision last week only a few days after the announcement that the Administration was cutting another $100 million from what was already the lowest space agency budget in six fiscal years.

Loudly dissatisfied by the austere state of the U.S. program, Webb declared last week that the U.S. is well behind the Russians in space and will be "in a second position for some time to come."

As head of a scientific agency, Webb has been, in a way, a maverick. It is as administrator of a vast Government-industry combine that he has largely filled his role. At college he studied education and law. His career included jobs concerned with industrial management, public administration and urban studies, as well as three years as director of the Federal Bureau of the Budget.

The substantial fortunes of NASA, until recent years, have largely been attributed to Webb's rapport with Capitol Hill—and as the space agency grew, so did the aerospace industry. As NASA became more and more Apollo-oriented, however, leaving other projects behind, Webb's leverage has become less effective. Many Congressmen, perhaps prompted in part by Webb's ability to say less with more words than almost anyone in Washington, have become less responsive to Webb's almost automatic references to Russia's leaving the U.S. behind.

As acting director of NASA to fill Webb's post, President Johnson has appointed Dr. Thomas Paine, who came to the agency as deputy administrator six months ago from General Electric. At GE his work was heavily scientific, including electronic, magnetic and high temperature materials research, along with solid state physics and chemistry.