

PHYSICS

Plan Five New Reactors

Atomic Energy Commission announces plan to build five different kinds of atomic piles as part of its long-range program to tap splitting nuclei for useful electric power.

► THE ATOMIC Energy Commission plans to build five new, large-scale reactors as part of its "five-year plan," Dr. Henry D. Smyth, a commission member, revealed at a meeting of the American Institute of Chemical Engineers in Washington.

Each of the five reactors, very different in kind, is aimed at "an economical solution" to the problem of getting usable electric power from the atom. Although experimental models of these proposed reactors have been built, the new plants will be the first on a power-producing scale.

One of them will be a self-regulating, water-cooled reactor in which the atomic pile is allowed momentarily to "run away." This causes the cooling water to boil, reducing the power of the reactor so rapidly that no serious damage is done.

In the new reactor, Dr. Smyth explained, it is planned to use this boiling of the water as a very cheap method of extracting heat from the pile. The design is based on experiments carried out last summer at the AEC's Idaho Test Site, Arco, by Dr. Walter Zinn, director of the Argonne Laboratory, and his associates. They pushed a small water-cooled reactor, especially built for the studies, to see if it "would run into trouble," if the water flow were stopped unexpectedly.

They did this by ejecting the control rods suddenly so that the power generated by the chain reaction went up in a fraction of a second from a few watts to many thousands of watts. The water then "boiled so violently that it made a small geyser," Dr. Smyth reported.

Another new reactor the AEC hopes to build is a breeder of intermediate size, which will be "much larger and much more nearly a power-producing, continuously operating reactor" than the small experimental one presently being run in Idaho. Temperatures and steam pressure, Dr. Smyth said, will be increased to those appropriate for a full-scale power breeder reactor.

The third new reactor is a larger version of the homogeneous reactor, which uses a solution of uranyl sulfate in water for its "fuel," the water serving as the moderator, and uranyl sulfate serving as the fuel elements for the chain reaction. This one, Dr. Smyth said, will be a "step in the direction of a practical power-producing unit and should give us information about corrosion, chemical processing and operating conditions."

Present specifications call for only about 750 kilowatts of power in this reactor. The next step, already planned, will be a re-

actor producing 65,000 kilowatts of heat, or about 16,250 kilowatts of power, in a homogeneous reactor which will breed uranium 233 in a blanket of thorium surrounding the chain reacting core.

This is the first announcement by the AEC of attempts to breed the man-made isotope, uranium 233, from thorium in power-producing quantities.

The fourth reactor aims at a combination of two materials, the sodium-potassium metal alloy used as a coolant in the breeder reactor, and the graphite used as a moderator in the Hanford reactors, in order to get the advantage of high temperature without high pressure from the sodium coolant. This plant will be built with a heat-generating power of 20,000 kilowatts, but without an electric generating plant attached.

Plans for the fifth reactor, the so-called Pressurized Water Reactor, were recently announced. It will use slightly enriched uranium as fuel, ordinary water as a moderator and cooling agent, and will be operated under reasonably high temperature and pressure, although not nearly so high as are used in modern steam plants.

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MEDICINE

Hospital Aides Are Bobby Soxers

► BOBBY SOXERS from the town's high school have solved the problem of aide staffing for the new 22-bed hospital in Akron, 1,600 population town in northeastern Colorado, Mrs. Esther Thornton, superintendent of the town's Washington County Public Hospital, reported at the conference on rural health, sponsored by the American Medical Association, in Dallas, Tex.

The girls belong to an organization known as the "JUGS," short for Just Us Girls, sponsored by the hospital's auxiliary.

At four o'clock each day they come from school, eat cookies and drink milk, and transform themselves into perfectly groomed, pastel uniformed aides for service as nurses' aides or in dietetics, laboratory and X-ray work, office work and occupational therapy.

"They smile at us and look so clean, fresh and young," one patient remarked. "It's as though a spring wind is blowing through the hospital."

Mrs. Thornton said they are "doing a wonderful community service," and perhaps paving the way to satisfying careers for themselves.

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HUMAN GUINEA PIGS — In the hope that scientists will some day find the cause and, possibly, a cure for the common cold, these Englishwomen are two among thousands who have deliberately tried to catch a cold.

TECHNOLOGY

Transistors to Thwart Phone Eavesdropping

► EAVESDROPPING ON rural telephone party-line conversations may become a thing of the past if experiments near Americus, Ga., meet the expectations of Bell Telephone Laboratories engineers.

The engineers plan to try out a transistorized telephone system there that will permit several conversations to be carried over a single line without mixup. As a by-product, eavesdropping will go.

The principle already is used on long-distance telephone networks. However, until the tiny transistor was developed—making it possible to do the job electronically at a fraction of the usual cost—the method was uneconomical on a local basis.

Now the engineers believe they can make transistors work economically on lines as short as five miles.

When Mrs. Jones calls Mrs. Smith, the conversation will be transmitted on the line at one frequency. If Mrs. Brown, who shares Mrs. Jones' line, decides at that moment to call the grocer, her conversation will be put on another frequency.

The callers will not have to worry about getting on the right frequency. This will be taken care of automatically by the tiny battery-powered transistors mounted on the telephone poles. The conversations will be sorted properly at the line's terminal.

Bell engineers worked out the system in collaboration with five operating telephone companies and the Western Electric Co.

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