GENERAL SCIENCE

Swap Atomic Information

International Conference on the peaceful uses of atomic energy may open new era in which scientists and industrialists become more important than security officers.

By WATSON and HELEN DAVIS

➤ A DECADE of the atomic era has been needed to bring the nations of the world together to discuss how the atom can be harnessed for the world's good.

The first combat A-bomb that blasted Hiroshima on Aug. 6, 1945, seems remote in time. The accent at the International Conference on the Peaceful Uses of Atomic Energy in Geneva is on the usefulness of atomic energy, not its destructive dangers.

The big fact of the atoms conference is identical with that of the Big Four conference held in July in the same meeting halls:

Russians and Americans are sitting down and discussing their problems peacefully and constructively. The atoms meeting is much more inclusive, since not just the four top nations, but every nation that is working in the atomic field is participating, under the United Nations.

Few will be surprised to learn from the papers being presented that the Russians and many other nationalities have been able to dig out by the hard research way the facts that the Americans have also discovered and kept rigorously secret until now.

Remember that the Russians made A- and H-bombs by independent research.

For the good of the world, which but for atomic energy might die of slow energy starvation in the coming generations, there should be freedom for announcing all that is known about getting useful power from the atom, using the by-products of atomic energy for scientific exploration, industrial applications and medicine and health.

This will probably result from the discussions. We may be entering a period when scientists and industrialists will be more important than security officers.

Future Energy Needs

➤ THE WORLD will need eight times as much useful energy in the year 2000 as now, and only by the use of atomic energy can our civilization then meet the constantly increasing demand for energy without seriously depleting our reserves of coal, oil and gas.

In 1975 the need for useful energy will be the equivalent of 27,000 billion kilowatt hours of electricity compared with 10,200 billion kw-h in 1952 and 84,000 billion kw-h in 2000, Dr. Nathaniel B. Guyol, a United Nations expert predicted. More than half of this will be used in industry.

The earth will have a population of 5,000 million people in the year 2000, doubling the present world population. In 1975 it will be 3,500 million.

The world needs a new energy source, Dr. E. A. G. Robinson of Britain's Cambridge University and G. H. Daniel of the British Ministry of Fuel and Power told the conference.

Soviet Atom Knowledge

➤ THE FIRST detailed description of Russia's first atomic power plant by Soviet scientists at the International Conference on the Peaceful Uses of Atomic Energy brought the verdict that the Russians clearly understand the problems of atomic power development.

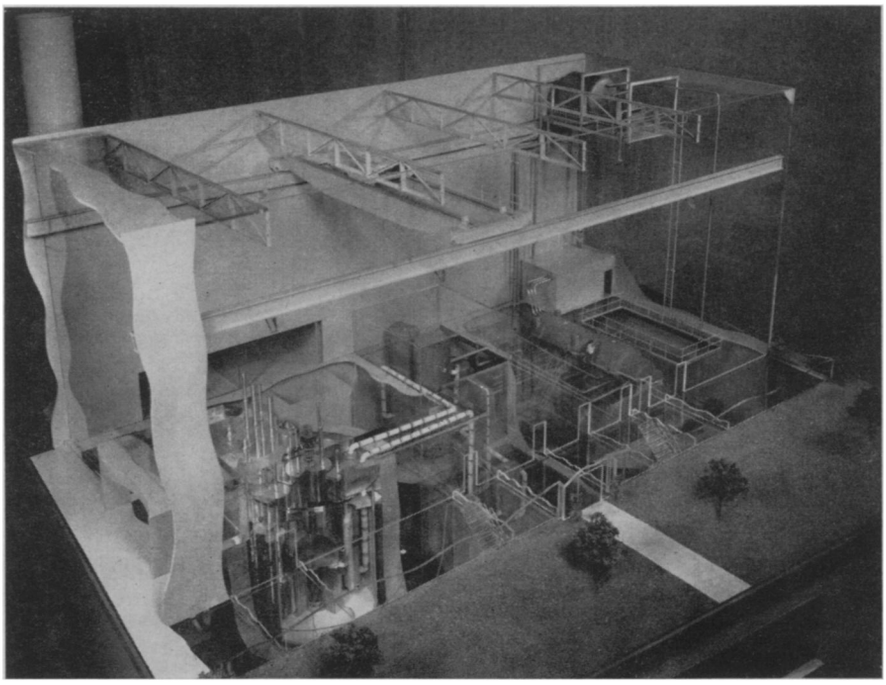
They have learned through their own research, as America has learned, the essential information to allow them to build and operate successfully an atomic power reactor.

The Russian power reactor with an output of 5,000 kilowatts began generating electricity at an unrevealed location on June 27, 1954, according to D. I. Blokhintsev and N. A. Nikolayev. Its fuel is enriched uranium containing five percent fissionable uranium isotope 235. Its total charge is 550 kilograms, 1,210 pounds.

The small Soviet power plant is described as the forerunner of a 100,000 kilowatt plant reported as being planned. Speculation is that it may actually be under construction and that, if completed in 1956, it could be the first large atomic power plant, nosing out the British 50,000-100,000 kilowatt plant at Calder Hall and the 60,000-plus kilowatt U. S. plant at Shippingport, Pa., due for completion in 1957.

The present Soviet plant is cooled by water under pressure and the fissioning of the enriched uranium is controlled or moderated by graphite. The heat transfer system consists of two circuits, with one flow of water circulating through the reactor under pressure of 100 atmospheres. Through a system of heat exchangers, the heat is transferred to another circuit of water which, transformed into steam, drives a turbogenerator.

Large power reactors building in the United States do not use exactly this scheme, but some of the reactors at the Hanford, Wash., plutonium plant do use water for cooling and graphite for moderating.



URANIUM TO ELECTRIC POWER—Shown in model form is the Experimental Breeder Reactor II, built to produce electric power. Designed by Argonne National Laboratory, the reactor uses enriched uranium as fuel. Heat is carried by liquid metal to the steam generator (center). The steam produces electric power in the turbo generator at right.