

CIVIL DEFENSE

Civil Defense Ineffective

► THE UNITED STATES cannot now survive a nuclear war because its civil defense system is hopelessly ineffective, Roy Ringo, physicist at Argonne National Laboratory, Lemont, Ill., has charged.

Present civil defense preparations, he said, "are less than those of England in 1939." The only method guaranteeing a chance to survive an attack with thousands of hydrogen bombs delivered by hypersonic missiles, a possibility within ten years Mr. Ringo believes, is "underground construction of factories and other critical facilities."

Neglect of civil defenses, he points out in the *Bulletin of the Atomic Scientists* (March), is caused by "irrational factors." These are the assumptions that: 1. war among the great powers has become impossible; 2. or even if war came, the enemy could not hurt us; 3. or an effective civil defense is not practical.

Mr. Ringo argues that these assumptions are unsound and suggests a practical defense system based on a separation of civilian and industrial defense. Its cost would be only 10% of the present defense budget or about \$5,000,000,000 a year, decreasing to \$3,000,000,000 after 10 years.

For the immediate future, Mr. Ringo's plan calls for dispersal of all new industrial construction, and stockpiling, at a rate of \$2,000,000,000 a year for five years, refined

metals, chemicals, machine tools, mill and foundry components, and other items needed to start an industrial plant, storing these in dispersed or protected places.

For the long-range plan, Mr. Ringo calls for a program of underground factory construction subsidized by about \$2,000,000,000 a year and started now.

His plan to save millions of lives includes simple backyard-type shelters, better shelters for workers in industrial and transportation centers, a food supply equal to one to three years production, medical supplies required for a year or two, and a stockpile of gasoline and fuel supplies for one year.

Mr. Ringo estimates the cost of this life-saving program, spread over a ten-year period, would come to roughly \$1,000,000,000 a year. With the industrial program cost, the total would be about \$5,000,000,000 a year.

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ENGINEERING

"Saucer-Topped" Plane To Guide Fleet Actions

► A FLYING "SEEING EYE" has been developed for the Navy as an airborne early warning station.

The "saucer-topped" plane, which is de-

signed to provide information to ships below on impending attacks by enemy sea and air forces, has made its first successful flight, according to the Grumman Aircraft Engineering Corporation, Bethpage, N. Y.

Capable of all-weather flight, the WF-2, as it is called, can also control friendly task force defense fighters in the interception of attacking planes. Manned by a crew of four, the WF-2 is equipped with a long-range antenna housed in its saucer-shaped top which is the largest radome ever designed for a carrier-based plane.

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MEDICINE

Virus Needed to Cause Cancer in Animals

► MORE EVIDENCE supporting the theory that viruses cause cancer has been uncovered by Dr. Francisco Duran-Reynals, research associate, Yale University School of Medicine.

Dr. Duran-Reynals has found that when a virus is added to a combination of an otherwise harmless amount of a cancer-causing chemical, it can produce cancers in mice, if the mice have had their resistance to infection lowered by injections of a hormone.

Neither agent will bring about the cancers by itself, nor will any combination of only two of them. Virus, chemical and hormone are all needed to cause the cancerous growths.

The virus used was vaccinia, the same type injected into man for immunization against smallpox. This was injected into mice that had already received a dose of cortisone.

Dr. Duran-Reynals found that when a standard cancer-causing coal tar product, methylcholanthrene, was painted on the animals, it took much less than the usual amount to produce cancers in significant numbers.

Cortisone weakens natural resistance by shrinking up primitive layers of tissue, or mesenchyme, along with its ground substance. This ground substance is a type of cement between cells that can harden or soften under hormone influence and let fluid-borne substances pass into and out of the tissues. This tissue and cell cement play an important role in destroying viruses.

Dr. Duran-Reynals was able to stop the cancer development by treating the mice with estrogen. The estrogen increased the natural resistance by building up mesenchyme and ground substance.

When dilute doses of the cancer-causing chemical were painted on the skins of the virus-infected, hormone-treated mice, those which received estrogen showed only a weak infection for four days. The cortisone-treated animals, however, showed a much stronger infection and eventually developed a great variety of both benign and malignant growths.

The research was supported by the American Cancer Society.

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EARLY WARNING AIRCRAFT—The WF-2, a modified version of the TF-1 Trader, will provide information to the fleet on impending attacks by enemy air and sea forces. The large "saucer-like" radome houses long-range antenna.