little as three minutes from the target.

Accuracy, however, is one of the FOBS' weak points. A Russian system, says the Defense Secretary, would not be accurate enough to destroy U.S. Minuteman missiles, protected in their silos, though "the Soviets might feel it could provide a surprise nuclear strike against United States' soft land targets such as bomber bases."

The most severe of the system's shortcomings, as far as U.S. ability to defend against it is concerned, is the need for many FOBS missiles to be launched at the same time. A few FOBS weapons waiting in orbit, disguised as satellites, would do no good, McNamara said. To be effective, a large number of them would have to be launched en masse, which would then make them susceptible to detection by a recently deployed countermeasure which the U.S. has developed, over-the-horizon radar.

The new radar sees around the curvature of the earth by bouncing its signals off the ionosphere. In case of a multiple Soviet FOBS launch, the signals would bounce off the wake left by the departing missiles and return to detection instruments in U.S. territory. Over-the-horizon radar would offer perhaps a 15-minute advance warning, about the same that BMEWS gives of approaching ICBMs. The new radar system, which has been in operation for scarcely two months, is due to become fully operational in the first few months of next year.

One concern when the FOBS announcement was made was whether the Russians had violated the space treaty by their test flights, the most recent of which was Oct. 28. The treaty, designed to keep weapons of mass destruction from being stationed in space, is only weeks old, having been ratified by the United States and the Soviet Union on Oct. 10.

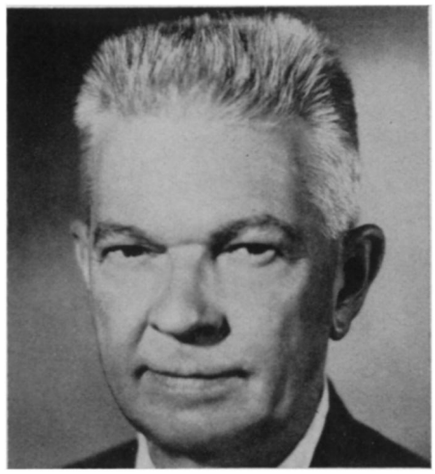
A FOBS system does not violate the treaty, McNamara says, because it is only in space for a fraction of an orbit. Flight tests of FOBS hardware, even for more than an entire orbit, would also be permitted as long as no nuclear warhead was included.

Last week, as a joint House-Senate atomic energy subcommittee began taking a close look at the controversial U.S. antiballistic missile program, the Defense Department's director of defense research and engineering, Dr. John S. Foster, said that Russia was making a mistake in developing an orbital bombardment system. Not only would the system fail to give them any additional military capability, he said, but it would offer less punch than if the same warheads were used in their regular form, as intercontinental ballistic missiles.

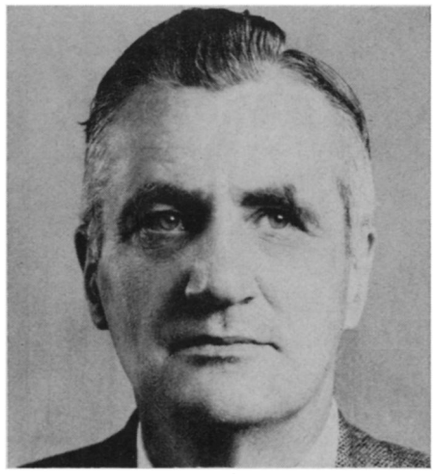
LASKER AWARDS

Two doctors and a Senator

Pepper



Phillips



Brodie

When cholera invaded Egypt in 1947, in that country's first outbreak in 20 years, Dr. Robert A. Phillips had just arrived in Cairo to head the Navy's Medical Research Unit. From work begun there and continued in Taiwan, Thailand and Pakistan, he conquered the disease, learning why it kills and how to stop it.

While Dr. Phillips was in the Orient, Dr. Bernard B. Brodie was in New York studying the biochemical behavior of antimalarial agents. His work on these drugs and others for heart disease, mental disorders and cancer has changed profoundly the course of drug studies and therapy (SN: 11/11).

As these two men pursued the substance of scientific research, Senator Claude Pepper (D-Fla.) pursued the economics of it, encouraging Congress to put money and support behind establishment of the National Institutes of Health. Backing from Pepper—now a member of the House—helped NIH get started and expand from a $2.4 million operation in 1944 to a $1.5 billion agency that today supports between 40 and 60 percent of all medical research in the United States.

Last week these three men met in New York to receive the 1967 Albert Lasker Awards—the most prestigious medical prizes in America. The awards, given over the last 22 years, carry a $10,000 honorarium from the Albert and Mary Lasker Foundation. Seventeen Lasker winners have gone on to win Nobel Prizes.

Dr. Phillips, currently director of the Pakistan-SEATO Cholera Research Laboratory, Dacca, East Pakistan, discovered that death from cholera is caused by dehydration. When Vibrio cholerae organisms grow in the intestine, body fluids and chemicals are thrown out of balance. The patient suffers severe diarrhea in which stool volume within four to seven days can exceed his body weight. Loss of water and electrolytes—chemical conductors essential to many physiological processes—kills unless quickly remedied.

Dr. Phillips' cholera treatment, which he says is so simple that even paramedical persons can administer it, consists of intravenous administration of an electrolyte solution which brings body chemistry back into balance. Effective in 99 percent of cases, its only problem is cost. Intravenous solutions are not produced in the developing nations where cholera is prevalent; importing costs are high. "Treatment may cost a peasant five months' wages," Dr. Phillips says. "While one member of the family is cured of cholera, the rest starve at home."

Dr. Phillips also has investigated cholera vaccines; so far effectiveness

lasts about three months. Although it is adequate for world travelers who can have it renewed as needed, science is a long way from developing a vaccine that will prevent cholera among the masses of people in poor nations, he believes.

In citing Dr. Brodie's work, the Lasker Foundation credits him with doing more than any man to make possible the rational use of drugs in many diseases. As a result of what he learned about the way neurohormones affect brain functions, for example, scientists know how to use drugs effectively in treating mental disorders—minimizing side effects and increasing therapeutic activity. Dr. Brodie, chief of chemical pharmacology at the National Heart Institute, Bethesda, Md., devoted 30 years to study of drug metabolism or breakdown. Animals and man metabolize drugs at vastly different rates, he has shown, making extrapolation from animal data a risky business.

Speaking of the future of basic research in the United States, Rep. Pepper said at a press conference in the Lasker Foundation offices overlooking the United Nations that this is no time to stop the flow of Federal funds. It is very ominous, he said, that some members of Congress think research money is being wasted. "We're just gaining momentum. We have to keep going—not slow down." ◈

REORGANIZATION

Kennedy backs NSF

After languishing more than two years in Congress, the bill to reorganize and streamline the National Science Foundation has found a Senatorial champion in Sen. Edward M. Kennedy (D-Mass.).

Kennedy got permission to organize an ad hoc subcommittee and hold public hearings on his version of a House-approved NSF bill, in an attempt to push it out of the Labor and Public Welfare Committee before adjournment. Hearings are slated Nov. 15 and 16, with key witnesses being NSF Director Dr. Leland J. Haworth; Dr. Philip Handler, chairman of the National Science Board; Rep. Emilio Q. Daddario, sponsor of the House bill; Sen. Fred Harris, and Presidential Science Adviser Dr. Donald F. Hornig.

New interest by Kennedy in science was sparked by his powerful science-oriented constituency from the Boston area during the heated appropriations fights in September and October, when he teamed up with Sen. Harris to push through a large increase in funds for the Foundation on the floor of the Senate, overriding cuts made in committee (SN: 11/7).