

because the House and Senate appropriations will have to be reconciled by compromise. It is unlikely that the House will reverse itself and finally allow the full amount in this compromise. Most usually the final appropriation figure falls between the upper and lower limits set by each chamber.

Atomic Clock To Orbit

A 30-pound atomic clock to be carried in an orbiting satellite is being developed, to give Einstein's general theory of relativity "the most searching check of its 43 years." The prototype of the clock is now under construction at the Hughes Aircraft Company's research laboratories at Culver City, Calif., under a \$200,000 development contract from the National Aeronautics and Space Administration. The clock will be accurate to within 3

seconds in 100 billion; this means an error of no more than 3 seconds in 3171 years. NASA has given similar contracts to the National Bureau of Standards and to Massachusetts Institute of Technology for other types of very precise clocks. Any actual satellite-clock launching is probably several years away, NASA said.

Before the launching, the atomic clock would be synchronized with another clock on the ground. The satellite would then orbit, at an altitude, for example, of 8000 miles, traveling about 18,000 miles an hour. The orbiting clock would generate a highly stable current with a frequency of 24,000 megacycles per second. By means of electronic circuits the rate of these oscillations would be reduced to a rate at which precise laboratory measurements could be conveniently made. The "ticks" would be transmitted by radio for comparison with data from the clock on the ground.



Harold Lyons, inventor of the first atomic clock, examines the tubular core of another model which is to be put into orbit around the earth to check Einstein's general theory of relativity.

Administration Reaffirms Stand on Nuclear Plane

The Administration has rejected proposals for early construction of a flying model of a nuclear-powered aircraft. The proposals, which had been examined in the past, were brought up for review at the insistence of members of the Joint Congressional Committee on Atomic Energy, who cited the propaganda advantages of building such a plane before the Soviet Union does. In rejecting the "fly early" proposals the Administration indicated that efforts would be concentrated on development of more advanced reactor fuel elements for the reactor-jet-engine combination that will eventually power the craft.

The decision reflects the Administration's belief that more research is needed before an adequately performing power plant can be developed for the plane. This point has recently been stressed by White House science advisers and Pentagon officials. In his last speech before leaving office, James Killian, chairman of the President's Science Advisory Committee, spoke of the need for careful preliminary work before continuing the nuclear plane project. Herbert York, research chief of the Department of Defense, said in testimony before a House committee that he believed the over-all cost of developing such a plane would be at least \$10 billion. It has been estimated that approximately \$1 billion has been spent on the project over the past 13 years.

Members of the Joint Congressional Committee on Atomic Energy described the Administration's move as a "backward step" that will postpone the first flight of a nuclear airplane by at least 2 years. Representative Melvin Price (D-Ill.), chairman of the Atomic Energy Research subcommittee, announced that public hearings would be held next month on the Administration's "lack of decision" on the controversial project.

Scientists in the News

WARREN WEAVER, vice president for the natural and medical sciences of the Rockefeller Foundation, will retire on 1 August. At that time he will become vice president of the Alfred P. Sloan Foundation. He will continue his activities on the National Science Board, on the National Advisory Cancer Council, on the Council for Library Resources, as vice chairman of the Health Research Council of the City of New