

Science Foundation to build it, and that in any case the bureau prefers another proposal of the Dicke panel, the building of a 210 foot diameter dish designed to operate at millimetre wavelengths. But the two telescopes are in no way alternatives, as the bureau seems to imagine, and Dr McElroy, the director of the National Science Foundation, has fully endorsed the Smithsonian's attempt to construct the 440 foot dish.

Besides its astrophysical observatory, the other scientific establishments supported by the Smithsonian include the Museum of Natural History, the Tropical Research Institute, the Radiation Biology Laboratory, the Office of Environmental Sciences and the National Zoo in Washington, DC. Dr Sidney R. Galler, the Smithsonian's assistant secretary for science, expressed his concern to the House Subcommittee that the "future for our natural history collections is a cloudy one", largely because the Federal support for taxonomy has been declining at the same time as the demands for taxonomic information are increasing because of attempts to keep tabs on the deterioration of the environment.

This theme was given substance by Dr Richard S. Cowan, the director of the Museum of Natural History, who estimated that the museum contains some 500 million data items but too few staff, especially technicians, to deal with them. Moreover, from lack of funds, the staff is shrinking almost as fast as the collections are expanding; since 1965 the museum's fish collection, for example, has swollen to 2,100,000 specimens, an increase of 17 per cent, while its ichthyological staff of twelve has lost a shark specialist, a technical assistant and a typist. Because of Federal stinginess, more than nine-tenths of the total museum budget has to go on salaries, leaving only a tenth to provide the equipment for research and curation. As a result, the museum is able to allow each scientist only \$460 a year for travel and \$200 for supplies and equipment, which is less than what many advanced graduate students receive.

The subcommittee heard a happier tale from Dr I. Eugene Wallen, director of the Smithsonian's Office of Environmental Sciences. Dr Wallen described his hopes for the biological research vessel *Phykos* from which 100 American scientists will be able to study the Mediterranean—"a poorly known marine area"—over a five-year period. The office's studies of the Suez Canal, now in their third year, have shown that some 200 species of fish have colonized the Mediterranean from the Red Sea whereas few species have moved the other way. Studies are almost under way to make reference collections on either side of any sea-level canal that may be built across the Central American isthmus.

NASA

## Paine returns to General Electric

"DURING my direction Americans orbited the Moon and walked on its surface, achieving our boldest national goal on time and within budget." With these laconic words, a tribute to the managerial as well as the technical difficulties in getting men to the Moon, Dr Thomas Paine announced last week his resignation as chief of the National Aeronautics and Space Administration. He is to take up an executive job

with his former employers, the General Electric Company, at a salary probably four times the size of the \$42,500 he received as Administrator of NASA.

The agency's budget for the present financial year, which has nearly completed its passage through the Congressional treadmill, is likely to emerge at slightly less than \$3,300 million or some \$400 million less than last year. But Dr Paine denied that he was resigning because of this forced diminuendo in NASA's activities. The size of his four children's school fees—\$15,000 a year—seems to have been a larger factor, added to which the General Electric Company could probably make urgent use of a man of Paine's abilities. GE's abortive foray into computers is said to have cost some \$500 million and its losses in the nuclear power business may have run to \$300 million in the last five years.



Dr Thomas O. Paine, administrator of NASA.

So far, four names have been mentioned as possible successors to Dr Paine, whose resignation becomes effective in mid September. They are Mr Robert Seamans, a former deputy administrator of NASA who is now Secretary of the Air Force; Dr Hilliard Page, president of General Electric's Space Division; Dr Werner von Braun, now the Planning Director of NASA; and fourthly, Dr George Low, formerly assistant director at the Houston Manned Spacecraft Center and now Deputy Administrator. It was from this post that Dr Paine was confirmed as head of NASA, having been appointed as acting administrator when Mr James Webb resigned in October 1968.

Whoever succeeds Dr Paine will have to decide where NASA is to go, now that it has reached the Moon but been banned from landing men on Mars, for the time being at any rate. There are the remaining Apollo flights, reduced to six now that Apollo 20 has been cancelled, and some of these could be cancelled so as to loosen the shoe elsewhere. The shuttle programme, for example, may need more than the \$110 million budgeted for this year if it is to take off before the end of the decade as promised. There are also decisions to be taken on the size of the space station that the shuttle is to serve. And not the least of the problems of the new administrator will be to match the record of achievement under Dr Paine's rule.