prospectus, and USGS officials were dismayed.

They promptly set about having their own department take the initiative, and on 21 September 1966 Secretary of the Interior Stewart L. Udall announced a new Interior program, to be known by the provocative title of "EROS" (for earth resources observation satellites). "It is because of the vision and support of NASA that we are able to plan this program," Udall said.

Never has a government press release been put to more imaginative or creative use, for EROS was not much more than an idea, with little money and certainly no rockets behind it. The EROS "program head," William T. Pecora, director of USGS, had no more means than the Prince of Liechtenstein of building a satellite and putting it in orbit.

NASA knew that the Udall announcement was coming, but it had made no commitments. The agency, when asked for comment by reporters puzzled at Interior's venture into space, said, in effect, that Interior's announcement was premature and that there was neither money nor a flight plan to back it up. Moreover, NASA said that, "before a fully worked out program to use operational satellites can be approved, a long period of experimental work must take place."

Karth suspects, however, that NASA was unwilling to press ahead rapidly with an automated ERTS project because it wanted to include the earth resources survey mission in plans for long-duration manned orbital workshop flights. "Presumably such experiments have been viewed as a partial justification for the [orbital workshop] program," Karth observed in his recent report. He found it significant that, when NASA began its investigation of remote-sensing techniques in 1964, this work was assigned to the Manned Spacecraft Center at Houston.

In March of 1967, however, NASA had the Goddard Space Flight Center, in Maryland, undertake a study for an automated ERTS system, with a view to a launch in late 1969 or 1970. But, as Karth sees it, this decision to have the earth resources survey mission carried out by such a satellite came only after it was apparent that appropriations for an extensive orbital workshop program might not be forthcoming.

In any case, the Goddard study, together with an encouraging report from a 1967 summer study by the National Research Council committee on space applications, led NASA to seek funds to start work on an experimental satellite. Twice this request has been rejected by the Bureau of the Budget, in 1967 and again last fall; on the second occasion, NASA's appeal to the President was successful and $14.1 million has been budgeted, subject to congressional approval, for the ERTS project (the total cost of building and launching the two satellites is estimated at $50 million or less). USGS hopes to get $3.8 million this year, to be used for data processing equipment and studies on how to make the best use of information from the ERTS system.

In sum, while there may be truth to it, Karth's charge that NASA deliberately dragged its feet on the ERTS project with a view to making the earth resources surveys part of the manned flight program is hard to prove. It is indisputable, however, that NASA has been preoccupied with its manned flight activities, especially its Apollo moon landing mission, and has given much less emphasis to proposals for practical applications of space technology. The total "space applications" budget for fiscal 1970 is $135.8 million (which includes funds for weather satellites), this out of a total NASA budget of nearly $4 billion. In past years the proportionate share for space applications has been even smaller.

But, if such NASA overseers as Karth have their way, the agency will go into the post-Apollo period scrambling to deliver tangible economic returns for the nation's multibillion-dollar investment in space. The National Research Council committee has recommended that spending for such applications be at least doubled; further, it has said that NASA should look to automated, not manned, systems for its earth resources surveys and other space applications missions. In view of its declining budget and Congress' refusal so far to support an extensive manned flight program in the post-Apollo era, NASA would seem to have little choice but to try to make the most of ERTS and other projects for which it may be possible to drum up political support.

In this regard, NASA's friends over at Interior will be glad to help. Pecora and one of his lieutenants on the EROS team last year are said to have spoken to over 100,000 people about what earth resources satellites could accomplish. Besides making the rounds of scientific and technical societies, these evangelists have even appeared before groups such as the Hickory (North Carolina) Rotary Club, cultivating the grass roots and trying to make EROS a household word.—LUTHER J. CARTER

RECENT DEATHS

Frederick P. Brooks, 68; physician in general practice and former chairman of the department of health and physical education at East Carolina University; 21 January.

M. Robert Cobbledick, 66; former director of admissions at Connecticut College; 10 February.

Robert A. Cooley, 95; former senior entomologist, U.S. Public Health Service, Rocky Mountain Laboratory; 17 November.

Warren DeSorbo, 51; staff member of the General Electric Research and Development Center; 18 January.

Theodore S. Gilman, 50; associate professor of chemistry at the University of Colorado; 11 February.

James W. Goddard, 75; former research associate in the department of endocrinology at the Jefferson Medical College; 14 January.

James I. Hambleton, 74; head of the division of bee culture investigation in the Department of Agriculture; 4 January.

Cornelia Kennedy, 89; associate professor of biochemistry emeritus at the University of Minnesota; 13 January.

John C. McClintock, 62; associate clinical professor of surgery at Albany Medical Hospital; 3 February.

Raymond Morgan, 75; former head of the department of physics at the University of Maryland; 3 February.

Hans Rademacher, 76; emeritus professor of mathematics at the University of Pennsylvania; 7 February.

M. Lyle Spencer, 87; former president of the University of Washington; 10 February.

Ernest P. Walker, 77; former assistant director of the National Zoological Park; 30 January.

William D. Wilkinson, 67; chairman of the department of geology at Oregon State University; 3 January.

Erratum: In "Dallas: Larger education role proposed for research center" (13 Dec. 1968, p. 1252) it was stated erroneously that Texas Woman's University (TWU) at Denton, Texas, was a former state teachers college and that it was not, in the late 1950's, offering Ph.D. programs in science. TWU is, in fact, a former liberal arts college; Ph.D.'s in several technical disciplines, such as nutrition and textile technology, were conferred as early as 1953 and 1954.