

landing vehicle called Viking is planned for 1973 and two or three of a new Explorer series similar to the IMP-E spacecraft that orbited the moon in 1967 are also targeted for Mars.

Other Explorers are planned for Venus, and a 1973 Mariner mission is planned to swing by the mysterious planet, using its gravity to pick up speed to whip by Mercury, nearest planet to the sun. In 1972 or 1973, NASA plans to send one of the far-ranging Pioneer space probes out to the orbit of Jupiter, particularly to gather information on the asteroid belt that clutters up space in an orbit between the giant planet and Mars. This information will be vital in designing an even more elaborate mission, a grand tour that will visit the vicinities of Mars, Jupiter, Saturn and Uranus, taking advantage of a rare celestial line-up in the mid-seventies that will not occur again for almost 180 years.

Before NASA can send men to other planets, however, it is likely to need a booster even more powerful than the mighty Saturn 5, to get enough speed up to complete the mission in a reasonable length of time. A prime candidate is the NERVA nuclear rocket, which the agency has been trying to promote for years but which has been held to research-only levels for two years by lack of funds. The new budget request calls for a \$5 million increase to \$27.5 million in order to begin work on a flight-weight version, although it will only develop 75,000 pounds of thrust compared to the 200,000 pounds planned as recently as three years ago.

All the unmanned spacecraft will not be heading for deep space, however. NASA will continue launching its automatic solar and astronomical observatories, as well as geodetic and weather satellites. The biggest of the unmanned earth satellite items in the 1970 budget is \$44.2 million, almost doubled from \$24.7 million in FY 1969, for a pair of large Applications Technology Satellites designed to try out advanced ideas before they are put into operational use. Unlike their predecessors, ATS-F and ATS-G will carry large, 30-foot-diameter antennas for communications tests.

NIH

Hard choices made

Launched already into 1970 in terms of dollars and cents, the new National Institutes of Health are shifting gears to set priorities in the face of drawn purse strings.

Following a move begun by former director Dr. James A. Shannon, the powerful institutes, for 20 years a prime force in basic research, are matching their resources to the most

pressing demands of the health community, making choices that promise results in the short run, although the long-term effect cannot be foreseen. The total NIH budget is up \$90 million, to a total of \$1.5 billion.

Coping with an increase of funds for biomedical research of only \$21.2 million, NIH chose to funnel its money into existing priority programs such as cancer chemotherapy, heart disease and rapidly expanding efforts to find new methods of fertility control. Young basic scientists applying for training grants and fellowships will pay the price of that choice, though on the non-research side, the institutes will make a concerted effort to handle the manpower shortage by assisting medical, dental and related professional schools.

The schools, representing a total enrollment of 80,000, are slated for portions of a \$96.4 million package destined to go for faculty salaries, curriculum improvement and research into ways of shortening the training period without impairing quality. The package represents a jump of \$30.4 million, a 49 percent expansion over the 1969 program.

On the research side, the National Cancer Institute anticipates raising its obligations by \$2.983 million in fiscal 1970, says NIH budget officer Lee May, with emphasis on drug therapy, radiation treatment and lung cancer studies. The coronary drug program of the National Heart Institute stands to gain \$1 million over last year, with the heart institute as a whole prepared to spend \$163 million in 1970—a boost of \$2.131 million.

Other institutes in which research programs will gain include the National Institute of Dental Research (up \$504,000), the National Institute of Allergy and Infectious Diseases with a \$749,000 raise (\$200,000 marked for transplantation immunology work), and National Institute of Child Health and Human Development, by far the most favored with a boost of \$7.6 million. Of that, \$2.747 million are set aside for population research, much of which will be carried out under the new CHHD Center for Population Research.

In 1969, NIH awarded 6,966 training grants and fellowships worth \$198 million. Faced with economic facts of life, it plans to award 688 fewer in 1970, to the tune of \$190 million.

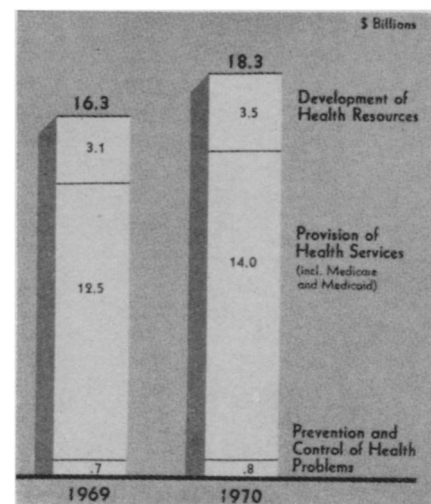
Theoretically, May explains, the Bureau of Health Manpower, slated to jump \$39 million in obligational funds next year to \$245 million, will make up for some of the loss by granting support that might otherwise have come from individual institutes.

In the last few years, the total of NIH grants, including training grants, fellowships and awards to individual

scientists to carry out specific research projects, has dropped in spite of small but regular increases in the budget. May points out that the cost of each award has risen, even if numbers haven't. In 1968, 11,182 grants cost \$804 million; in 1969, 10,598 grants will total \$814 million; in 1970, 10,549 grants are expected to cost NIH \$824 million.

HEALTH CARE

Something for everybody



Budget Bureau

Government increases health outlay.

Decent medical care for every citizen is the ambitious goal set forth by President Johnson in his budget message, and the allotment of funds for Medicare, Medicaid, veterans and children seems adequate on the surface to make this possible.

Outlays for health services will rise to \$14 billion in 1970, with \$9.8 billion going for the Medicare and Medicaid programs, and \$3.1 billion for the health care programs of the Veterans Administration and the Department of Defense.

The President points out that an estimated 9.5 million aged persons will get assistance in paying their hospital and doctor bills through Medicare payments and that Medicaid will provide medical assistance for more than 10 million needy persons.

Although expenditures for the 1970 Health, Education and Welfare programs total \$51.8 billion, which is an increase of \$5.6 billion, obligations by HEW for research and development, including facilities, will decrease by \$36 million to a level of \$1.339 billion in 1970.

Major biomedical research and development efforts will continue to be concentrated on mental illness, cardiovascular disease and cancer. Other biomedical research and development that will receive emphasis include in-

vestigation into eye diseases and visual disorders by the newly created National Eye Institute; research in family planning and fertility control and the development of vaccines against diseases such as rubella, or German measles.

One thing that will need revision at the end of 1970 is the Hill-Burton program, which will expire after boosting hospital and long-term care facilities at the rate of about 25,000 beds a year. Federal loan guarantees and interest subsidies for modernizing hospitals and building new ones will be needed along with grants to help build special new facilities.

Work has been started on studies aimed at controlling the appalling rise in medical costs, but legislation is needed to enable the Government to install new methods of payment, as they prove effective, for providing quality care at lower costs. Reimbursement for drugs now covered by Federal programs involving payment for health care will require new laws.

Funds set aside for air pollution research, development and demonstrations will grow by more than 17 percent, or \$7.7 million, to more than \$53 million.

The 1970 budget also includes funds to implement the Radiation Control for Health and Safety Act. It is aimed at protecting the public from harmful radiation emitted by electronic products such as color TV sets and microwave ovens. An increase of \$1 million will be used to develop performance standards for certain electronic products. An additional half a million dollars will be used in 1970 to study uranium miners and others exposed to radiation.

Appropriations for grants to construct community mental health centers, or to expand services, will rise in 1970 by \$17.1 million, to a level of \$81.8 million. By June 30 it is expected that there will be 428 community mental health centers serving 66.3 million persons. One year later, there should be 515 centers serving an estimated 79.8 million people.

GROWTH

Transportation and cities

A significant start is being made in applying technology to urban problems. In terms of money, the funds obligated in the 1970 budget are still small, but the growth rate is high. In transportation, for instance the R&D budget will be almost tripled in 1970 over last year, growing from \$18.5 million to \$45 million. Housing research has gone from zero to \$31 million and crime research from zero to \$22 million in five years.

Research in these urban agencies represents applied science of a kind that has long been possible—the use of computers, for instance, in police communications and control of patrol cars. But money to do the job has only been available in the past year, under the Safe Streets and Crime Control Act.

In 1970, Transportation hopes to demonstrate a system called dial-a-bus. The vehicles themselves would be a kind of cross between taxis, jitneys and buses, available on request and capable of carrying passengers door-to-door. Computers would be used to make efficient decisions on the requests.

If the demonstration gets underway next year, dial-a-bus will have about \$8 million to \$9 million behind it.

A second major project—the mini-car or bimodal vehicle—could also be ready for demonstration in 1970. A few prototypes will go on display in Philadelphia this spring. The mini-car is nine feet long and as wide as a compact car. The plan is to use the car first for intracity transportation, then eventually hook it up to automatic highways for commuting.

Eventually the mini-car will run on electricity; in the short run, until electric engines reach a higher state of development, the car will probably be a hybrid engine; half electric and half steam or gasoline.

These two systems alone could go far toward solving the urban crush if people can be persuaded to leave their cars at home. Nevertheless, transportation is putting some \$12 million to \$15 million into the central city problem. Plans for the central city include moving belts, better traffic regulation and an innovative horizontal elevator still in the idea stage. The horizontal elevator is essentially an elevated track system moving around and even through buildings with small cabs.

Cities that can use rapid rail transit, however, will soon have a model system in the San Francisco region to follow. Transportation is putting several millions of dollars into the Bay Area Rapid Transit system for design of a fast, reliable subway. It will also spend \$1 million to find a means of tunneling under cities with the least disturbance at the surface.

Conspicuously absent from President Johnson's budget request last week was one controversial item: the supersonic transport. This was not a reflection of President Johnson's opinion of the plane, however. The reason was that, also last week, the Boeing Co., winner of the competition to build the plane, was just resubmitting its final design proposal. No word on the plane's funding—which could come to \$250 million for fiscal 1970—is expected until April.

INTERIOR

Satellites and safety

With \$6 million in new funds for 1970, the Geological Survey plans to spend half that on an earth resources satellite. The satellite, developed by NASA, is outfitted with cameras and sensors capable of looking at the earth through many parts of the spectrum—infrared, ultraviolet and others. Consequently a mass of new data on such things as crop disease, ground temperature and natural resources will come streaming to earth (SN: 6/11, p. 527).

But the utility of these sensors must be tested and the data organized into useful form. This is the job of the Geological Survey. Fiscal 1970 represents a major turning point in the development of EROS (Earth Resources Observation Satellite) from research to construction of a data system. Until now the project has been kept very small.

Besides the Geological Survey, the Department of Interior will seek new research money in mine safety and in such areas as underground transmission technology.

Increases for the Bureau of Mines total about \$12 million, of which \$4.4 million will go into mine safety and inspection. Responding to last year's mine disaster near Farmington, W. Va. (SN: 12/7, p. 567), the Bureau will put \$1.6 million in research to control the dangers of gassy coal mines. Last year the bureau had only \$400,000 for this purpose.

It was subjected to considerable criticism for the size of the effort.

COMMERCE

Metrics, patents, weather

A metric study may at last be in the works. The Department of Commerce's National Bureau of Standards has \$4 million in new funds for its various programs, a piece of which will probably go toward studying the effects of converting U.S. measures to the metric system. But there are obstacles. Congress authorized such a study last year, then eliminated the funds. Although some preliminary moves have been made, the NBS must go back to Congress and this time request the funds before the full study can be undertaken.

Elsewhere in the Department of Commerce, the Patent Office is seeking a \$3.6 million increase for accelerated printing to reduce the backlog of unpublished patents, and the Environmental Science Services Administration requests \$1.4 million more for additional research in the world weather program.