

. . . Federal budget

purse of the National Institutes of Health by 9.2 percent over last year's expenditures. NIH supports 40 percent of the nation's biomedical research.

NIH officials estimate that 40 percent of the \$1 billion NIH appropriation will finance fundamental science. In line with the President's call for "payoffs" from health research, two areas were singled out for emphasis.

The two, pharmacology and toxicology, have been overshadowed by more glamorous work in heart, cancer and stroke research. Training programs in the two fields would get \$6 million, an increase of \$900,000. About \$9 million,

or \$2.5 million more than last year, will be poured into research activities in these specialties.

The number of available and potential drugs today is many times what it was even 10 years ago, yet work in the basic physiology of drug behavior has not kept pace. Safer, more effective drugs are expected to come when science has better understanding of exactly how drugs are metabolized and under what circumstances they are hazardous.

In another move to strengthen the chain of scientific discovery, the General Research Support Grants Program anticipates spending \$11 million, a jump

of \$7 million over 1967, on its Health Sciences Advancement Awards. This is designed to help upgrade the quality of science education all over the country, and strengthen weaker disciplines such as biology, and physiology. Advancement Awards will go to medical schools and graduate departments which will then disperse funds to best meet their needs. Until recently, money has been appropriated only for specific research projects.

Regional medical programs to combat heart disease, cancer and stroke got in for \$64 million, an increase of \$19 million over 1967.

ASTROPHYSICS

Data, Not Answers

Astronomers may have detected the largest explosion ever known—short of the "Big Bang" in which the universe was created, and even that inconceivable fireball may have left remnants now being measured.

Evidence for the large explosion comes from the study of quasars, which intrigue scientists by their quality of becoming more confusing as more data on them is assembled. At first thought to be the universe's most distant objects, the quasars now have no agreed distance from earth.

Sources of tremendous energy output, both in light and in radio waves, the mysterious objects, discovered in 1962, were among the subjects of a symposium on Relativistic Astrophysics in New York last week.

Three new observations were reported—all of them unexplained.

One was the sudden growth in brightness of quasar 3C 446, reported by Dr. Allan R. Sandage of Palomar Observatory. The object increased in light emission by 3.2 magnitudes—about 20 times. This could be the most violent explosion yet detected.

Also reported was the recently discovered background radiation that may be the remnant of the primeval fireball in which the universe was formed. Over a wavelength range from 21 centimeters down to nearly one millimeter, background radiation has been observed with a spectrum that corresponds to a black body with a temperature of about three degrees Kelvin—close to but significantly above absolute zero. Scientists want further readings in more wavelengths before declaring this cold message evidence of a beginning of the cosmos. Finding that the radiation comes equally from all parts of the sky would be strong evidence that the expansion of the universe has been

uniform in all directions throughout its history. Evidence both for and against uniform distribution was presented.

One mysterious quasar was reported to show two different distances from earth, depending on how its light is measured.

When the light of any star or galaxy is spread out, it has a rainbow array of colors from red to ultraviolet, which is called a continuous spectrum. Within the spectrum, certain lines appear. Some represent elements in the star, and are called emission lines; others caused by matter between the source and earth are called absorption lines.

The quasar Pks 0237 minus 23 shows one red shift when its light is measured by emission lines, another when absorption lines are examined. If both observations are correct, as they are believed to be, then one part of the quasar is receding from earth 15,000 miles per second more slowly than the rest of it.

No explanation for this effect is available, but suggestions have been made that it could result from matter thrown out of the quasar or from materials falling into the object from beyond.

Dr. Maarten Schmidt of The California Institute of Technology reported discovery of the double red-shifted quasar to the symposium, based on studies made by Dr. Halton C. Arp of Mt. Wilson and Palomar Observatories, Dr. John G. Bolton of the Parkes Observatory in Australia, Dr. Thomas D. Kinman of Lick Observatory and Dr. Margaret Burbidge of the University of California at La Jolla.

Dr. Sandage also reported that he had made a tentative optical identification of a source in Cygnus previously detected only by its X-ray emission. This is only the third X-ray source to be optically identified.

PUBLIC POLICY

Science Toys Urged For Poorer Nations

Birth control and chemistry sets might help the underdeveloped nations out of their current plight, it was suggested in Washington last week.

In a session convened by the House Science Committee, foreign and domestic scientists conferred about the technological gap between advanced and other nations. All agreed it was too large and getting larger each year.

Dean Rusk, Secretary of State, urged the widest dissemination of birth control information to help head off famine. "The entire human race," he said, "must look at the future arithmetic" which shows food supplies falling behind population growth.

Scientists from India and Latin America joined Mr. Rusk in voicing alarm at the widening gap between rich and poor nations. Substantial advances in education and research at home and heavy aid from outside will be needed just to keep up, they said.

S. Husian Zaheer of India referred to all present programs of aid to his country's science as "very laudable . . . but a drop in the ocean considering the immensity of the problem."

Carlos Chagas of Brazil found the situation critical. A gap increases every day between the Latin American nations and the developed countries."

Both Zaheer and Chagas pointed to a lack of scientific interest or awareness among their people as a major problem.

The noted American astronomer Fred L. Whipple suggested that one attack might be found in toys. Remembering how his own bent toward science was formed by toys he played with as a child—a construction set, chemistry set and a telescope, Dr. Whipple suggested that manufacturers in underdeveloped countries be subsidized for production of scientific toys.