one was saying when they would be ready.

If results are announced, there is no indication they will be applicable to any but the four ships investigated. Samples were apparently taken at random from parts of the hulls still protruding from the sea floor. Critical analyses of seawater chemistry and biological activity that to be valid would have had to have been made as soon as the samples were brought up, have yet to be finished. And four out of 100 is probably too small a sample to permit any reliable generalization to be made concerning the condition of the remaining 96. ◈

COLLEGE OF SURGERY

Fat down; Transplants up

Ever since Mer-29—a drug to lower cholesterol—was taken off the market because of dangerous side effects, scientists have been searching for a safer substitute.

Now a Duke University researcher, who is afraid he might get hardening of the arteries, has completed a three-year test on himself and some 65 other patients with a new drug that seems to be an answer.

Dr. Robert L. Fuson told the American College of Surgeons meeting in Chicago last week that a powdered plastic known chemically as cholestyramine has reduced his cholesterol level from 250 milligrams per 100 cubic centimeters to 50.

The drug combines with bile acids in the intestines and prevents their reabsorption into the blood. The body, compelled to manufacture more bile acids, uses serum cholesterol, thus lowering its level.

Not only does it lower cholesterol, cholestyramine reduces fat absorption and may be beneficial in weight reduction. The drug is not yet approved by the Food and Drug Administration, but Dr. Fuson is confident that it is just a matter of time before it will be on the market.

A new life-saving operation was performed at the University of Washington Medical Center in Seattle where several youngsters, including a 6-week-old baby, survived open-heart operations after their body temperatures were lowered to about 60 degrees F. Babies usually die if operations are performed using a heart-lung machine, so this suspended-animation method is hailed as a promising approach.

Dr. Hitoshi Mohri, a Japanese visiting scientist at the University, reported the heart operations which were performed under ether anesthesia. The survivors are all in good health and leading normal lives up to two years after surgery.

The results of the body-cooling experience both in humans and dogs suggest that it may be possible to stop the circulation for 90 minutes or more—allowing ample time for repair of the most complex heart lesions.

A unique brain transplant was probably the most dramatic surgical achievement revealed at the convention. Dr. Robert J. White of the Western Reserve University School of Medicine in Cleveland has previously amazed medical scientists by keeping a monkey brain alive outside its body. Now for the first time he has demonstrated that a transplanted brain can be kept active for periods up to three days.

The brain presents almost insurmountable problems because it requires a continuous blood supply to survive. Dr. White's group cooled the isolated brains of 10 different dogs and transplanted them to the necks of other dogs. The necks of the recipient dogs were carefully opened and prepared as large skin pouches. Circulation was provided by the carotid artery and jugular vein.

LONG-LINE INTERFEROMETRY

Continent-wide antennas probe space

Radio astronomers are expanding the use of earth itself as the base of giant antennas to tune in on the broadcasts of heavenly objects (SN: 6/10). The technique permits observations far more precise than any single instrument could provide.

In the most recent advance United States scientists used two antennas separated by 2,180 miles to observe a mysterious object known as quasar 3C-273-B, an optical and radio source located some 1.8 billion light years from earth in the constellation Virgo. The observations were timed with atomic clocks, then correlated by computer. Quasars are little-understood sources of the universe's most intense radiation.

Besides the transcontinental effort at what is called long base-line interferometry, scientists from Massachusetts and from England's Jodrell Bank have made simultaneous observations across the Atlantic Ocean, a base line of 3,000 miles. Their data are still being analyzed.

Even more ambitious are the plans to span the Pacific Ocean, from Australia to California, with a radio telescope, in effect, 7,000 miles across.

In the trans-U.S. observation, astronomers from the National Radio Astronomy Observatory at Green Bank, W. Va., the University of California at San Diego and Arecibo Ionospheric Observatory in Puerto Rico teamed the 140-foot Green Bank antenna with the Hat Creek, Calif., Observatory's 85-foot dish.

The two telescopes were operated on a wavelength of 18 centimeters. After correlation by the computer, the data showed the angular diameter of the quasar to be smaller than five-thousandths of a second of arc.

This is the smallest angular dimension ever measured directly for a celestial object, providing confirmation that the 3C-273-B is one of the most compact and intense sources of energy known in the universe.

Its energy production is comparable to that of 1,000 galaxies of hundreds of millions of stars, such as the Milky Way, but it is only one five-hundredth as large as a single galaxy.

The high degree of resolution, by which the angular size was measured, was obtained by applying the principle of interferometry—two or more telescopes look at the same object at the same time. The farther apart the telescopes are, the distance being called the base line, the better is the resolving power. Measureable differences in the signal received by each of the instruments provide the information on the source.

Until recently, the only way radio astronomers could use interferometry was to physically connect the two radio telescopes, combining the signals from each telescope electronically for analysis. Because of difficulties in the electronic system, this method is not satisfactory for distances over 100 miles.

The new technique allows base lines thousands of miles long for the interferometer, yet eliminates the necessity of physically connecting the two antennas. Observations taken at each radio telescope are synchronized by extremely accurate atomic clocks and recorded on magnetic tape for later combining.

The atomic timers are synchronized to within less than a millionth of a second; precise correlation of the recorded signals can be made with a computer.

The technique of radio interferometry using long base lines was developed and is being explored by astronomers in Canada, Britain, Australia and the United States. First results were reported last spring by the Canadian group, followed shortly by the Haystack Micro-Wave Facility of the Lincoln Laboratory, operated by Mas-

sachusetts Institute of Technology, and the U.S. Naval Research Laboratory.

The West Virginia-California link was achieved by Dr. B. G. Clark of NRAO, Dr. M. H. Cohen of the University of California at San Diego and Dr. D. L. Jauncey of the Arecibo Ionospheric Observatory, which is operated by Cornell University, Ithaca, N.Y. The results are reported in the current ASTROPHYSICAL JOURNAL. ◈

SCIENCE BUDGETS

The hidden knife

Hidden beneath the fierce economy drive in the House of Representatives for the past two weeks is a knife ready to slash science budgets across the board. Research has been singled out as one area where budget cutters can slice without getting nicked themselves.

For the long haul everyone favors economy, but no Congressman wants his red pencil to be the one that keeps his district from getting a new post office, the space agency from exploring

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space, the aviation industry from building a supersonic transport or the National Institutes of Health from carrying on its fight against disease.

Excepting those, both Representatives Wilbur Mills (D-Ark.), chairman of the tax-writing House Ways and Means Committee, and House Appropriations Committee Chairman George H. Mahon (D-Tex.) have pointed a finger at the nation's research and development program as a likely target for economizers.

Congress is now expected to spend weeks reviewing and pruning appropriations bills that should have been enacted before July 1. In the meantime, while they wait to see which programs will have to live with long-term slashes, research-supporting agencies will continue to function at last year's level, unable to finance new programs. ◈