cost," and the Secretary of Health, Education, and Welfare is authorized to experiment with methods of reimbursing those organizations that participate in Medicare and Medicaid programs to offer incentives for cost reduction. Under the new bill, HEW is also required to study the possibilities of implementing a generic drug law and to evaluate proposals for creating a Federal Formulary Committee to review drug costs and quality and write a list of approved products. HEW is already launched on such a study; its recommendations are expected before January 1969.

SURGERY

Three Girls Survive Liver Transplants

"Now we are three."

While world attention focused on heart transplants, the second of five baby girls making history with long-lasting liver transplants died in Denver at the University of Colorado's General Hospital.

Paula Kay Hansen, slightly over two years old, whose parents had brought her from their home in Fort Worth, Tex., for replacement of a defective liver Aug. 1, is the latest to succumb to the immunity problem—her body rejected and attacked the foreign tissue. Carol Lynne MacCourt, of Salt Lake City, died the day she was 16 months old after surviving her transplant two months. The longevity record is held by Julie Rodriguez, whose transplant was made July 23.

Dr. Carl G. Groth of Sweden, a Public Health Service international fellow in surgery, who assisted Dr. Thomas E. Starzl and half a dozen other surgeons and pediatricians with the transplants, says they are encouraged by the babies' survival records and plan to do further transplants as they are needed and as livers can be obtained.

The three still living—all two years old or less—are Julie Rodriguez of Pueblo, Colo., Kerri Lynn Brown of Long Beach, Calif., and Candy Barbaree of Orlando, Fla.

Before the present series of transplants, the longest life of a transplanted liver was in a 47-year-old merchant mariner named William Grigsby who lived 34 days before rejecting the organ.

In 1963, a Peter Bent Brigham Hospital team led by surgeon-in-chief Francis D. Moore of Boston had removed the cancerous liver of 58-year-old Joseph J. Bingel, a Dorchester, Mass., construction worker, and transplanted the liver of a patrolman named Edward C. Callahan, who had died from a pistol shot in the brain. But 11 days later, Joseph Bingel died.

Liver transplants have been attempted in France and England, Dr. Groth says, but all patients have eventually rejected the foreign tissue or died of infection.

Dr. Groth will not compare the difficulty or importance of liver transplants with those of the kidney or heart, for example. "If you need a kidney, that is most important," he says. "There is no point in such comparisons."

But surgeons know that the liver is extremely complex. At three and a half pounds it is the body's biggest organ. It secretes bile for digestion, it breaks down protein into simpler compounds, stores blood sugar and fat, maintains chemical levels within the blood and cleanses the blood of foreign matter.

Auxiliary livers have sometimes been used in so-called "piggy-back surgery" in which the recipient's liver is undisturbed but aided in function by a second organ inserted in his abdomen.

The critical factors in achieving the long-term survival of the liver replacements in Denver has been a combination of antilymphocyte globulin (ALG) and immunosuppressive drug therapy. ALG is an extract of antilymphocyte antibodies. Lymphocytes are one type of white blood cells believed to be the specific agent that carries the body's immunologic assault against foreign tissue. Antilymphocyte serum is obtained from animals immunized against human lymphocytes.

Imuran and prednisone are two immunosuppressive drugs used, but by cutting off the immunosuppressive system, they lay the patient open to infection. He may not reject the transplanted organ but will die from pneumonia or some other disease.

Meanwhile, in Capetown, South Africa, Louis Washkansky was given a good chance for long-term survival with the heart of a woman beating in his chest. Also surviving is a 10-year-old African boy who received one of the same woman's kidneys as a transplant.

The American Medical Association's review of medicine for 1967 points out that although the "transplantation of internal organs is still a highly experimental procedure, kidney transplants have an increasing record of extending life usefully."

According to the journal TRANSPLANTATION, nearly 1,200 kidney transplants have been performed around the world. Among the patients receiving them, 55 percent survived one year or longer if donor and recipient were related. Among transplants done since Jan. 1, 1965, the year-or-longer survival rate has been 65 percent when donor and recipient are related.

SST

Concorde Rolls Out

The Western World at last has a supersonic transport. Just one. It won't fly until at least the end of February, and it won't carry passengers until three years after that, but the idea has become a reality. The first commercial travelers to really get a look at the curvature of the earth will be those flying the Concorde, the Anglo-French SST whose prototype was rolled out of its hangar at Toulouse, France, last week for its first public display.

Sixteen airlines have so far ordered 74 Concordes (nine U.S. airlines account for 38 of them), and more sales will certainly follow. The U.S. Boeing supersonic transport will be almost 400 miles per hour faster, however, and up to 170 passengers bigger, and Concorde officials realistically acknowledge that the two planes are destined for different markets.

If SST proponents on both sides of the Atlantic are even partly right in their optimism, the Concorde should give enough of a boost to air travel to convert presently less-traveled routes into high-density ones. In 1974 or 1975 the U.S. plane will begin passenger service, and within two or three years it should have sewed up most of the Concorde's former business on high-density routes, simply because its 300-passenger capacity will make it more profitable on such runs. When and if that happens, the Concordes will shift to less-traveled paths.

The American plane may actually be so efficient, according to W. J. Jakimiuk, president of Sud Aviation Corp., New York, the Concorde's French partner, that it will be priced out of the lesser-density routes. "One may forecast," he says, "that on such routes there will be no SST competition for Concorde, because the high productivity of the Boeing 2707 will make that aircraft very inflexible on any route where an airline's traffic potential does not exceed 100,000 passengers per year."

The Concorde will carry fewer passengers than many airliners now in operation, but it will cost passengers more to fly on it.

"Why should anybody fly subsonic if it costs no more to go supersonic?" asks the Concorde's deputy technical director, Dr. William J. Strang. "Regretfully," he says, "we conclude that a different fare will be used to protect the subsonic fleets."

The Concordes that go into commercial service will be nine feet longer than the 184.5-foot prototype. The Boeing aircraft has already grown 47 feet from its original conception, and its prototype has barely been started.

At first, Boeing had planned for its

supersonic transport to be 271 feet long, more than 100 feet longer than any other airlines in the sky at the time. Then it was decided that more passengers would be necessary to help pay for the super-expensive plane, so the aircraft was stretched by 27 feet and its passenger load increased by 41. That 298-foot version got as far as becoming a partial full-scale mockup in the summer of 1966, before the final designs had even been submitted to the Federal Aviation Agency in the SST competition.

By the time the design was submitted, it had grown another eight feet. Now it has been pulled out even farther, to 318 feet—18 feet longer than a football field—following recommendations from the 240-man team of Government and airline representatives which has been studying the design ever since the early stages of competition.

At last, Boeing's engineers seem content to go ahead and build the actual flying prototypes of the SST. Finally, according to Fred A. Maxam, the company's director of SST engineering, Boeing has reached "a very definite fix on the prototype design."

IMMIGRATION

New Law Curtails Brain Drain

The United States immigration law to take effect July 1, 1968, may, unexpectedly, throttle the much advertised brain drain. It radically departs from the long-standing procedure of setting quotas for individual nations. Instead, it sets an across-the-board limit of 170,000 immigrants a year and establishes six preference categories for admission to the United States.

Four of the categories apply to relatives of persons already in this country. Two refer to professional and skilled workers, allowing a total of 17,000 persons from each group to enter the U.S. each year on a first-come-first-served basis. As a result, the State Department says, immigration patterns will change dramatically and for the next three or four years the drain of scientific and engineering talent from European countries will be curtailed.

Under the old national quotas system, scientists and skilled laborers from Eastern countries, including India and China, have already added their names to long waiting lists. European scientists, who had no trouble getting visas in the past, now will have to get in line. The line for 17,000 places is already 48,000 persons long. Until scientists from Great Britain, France and other Western nations are in a position to compete actively for professional preference places—if they get in line now it will be at least 1970 before their turn comes—the bulk of immigrants will come from the four countries that last year lost major numbers of scientists and other professionals to the U.S.: China, 4,454; India, 3,224; Philippines, 2,690 and Korea, 1,087.

Indian Minister of Education Mullavasal Raja Ram says he does not consider the influx of Indian doctors and scientists into the U.S. a serious problem because "90 percent return home. The 2,000 or so who have stayed permanently are just a drop in the bucket."

From the British Embassy, scientific consultant Reginald Voysey says his country is not as concerned about its loss of professionals as it is about the migration of skilled workers—tool operators, draftsmen, etc.—who are vital to Britain's struggling economy. The new U.S. immigration law will keep some of these persons in Britain for the next few years.

Speaking of physicians and scientists, Voysey suggests the obstacles to U.S. admission may not be as insurmountable as they seem. These individuals may be able to take advantage of exchange visas which allow them to come to the U.S. for two years to pursue research. There are no numerical restrictions on exchange visas, he says, and once a man has one, it is possible to have it extended by a special waiver. Of the estimated 72,000 Britons who entered this country in the last decade on exchange visas, 6,780 received waivers. Half were physicians; half other professionals, including teachers and nurses.

FROM SWEDEN

Hospitals in Crisis

A triple crisis is hitting Sweden's hospital service. There is excessive investment in buildings, operating costs are soaring and there are too few doctors.

Sweden has about 900 hospitals for 7.8 million people, or 16 beds per 1,000 people, compared with 9.1 in the United States, and 9.8 in Britain. This year some $200 million will be invested in hospital building, six times the 1950 figure. By 1970 it will be 50 percent higher again.

At the same time running costs have now reached annually about a third of investment costs. Average costs to the community of a bed per day is $33, and up to $100 in some intensive care wards. Hospital running costs rose 17 percent in 1965, another 14 percent in 1966.

The hospital building boom is probably unparalleled in the advanced countries, and at the present rate the health services, provided as a public service, threaten to swallow 6.4 percent of the gross national product by 1980 compared with 2.2 percent in 1950.

The boom is partly the result of local politicians competing to give their counties the most and best in hospital care, but manpower supplies haven't kept up. Some 20 percent of physicians' posts in provincial hospitals are vacant or staffed by unqualified men, some wards are closed, and official figures suggest that if nursing needs are to be met every girl leaving school between now and 1970 and not taking a higher education must go into hospital service.

The computer bug has also bitten the health service. The 2 million inhabitants of Stockholm County, for example, are to be registered in a computer bank containing all relevant medical information. Doctors at any hospital in the county will be able to dial for information and receive it within seconds on a television screen.

But people are asking whether all these hospitals are an unmixed blessing. As economist Edgar Borgenhammer points out, for the cost of a new hospital it would be possible to build 20,000 service flats for old age pensioners; and a year's running costs would pay the salaries of 3,500 doctors or 7,000 nurses.

GASBUGGY

A-Bomb In the Gas Field

The twice-rescheduled Gasbuggy explosion (SN:12/9), a thermonuclear test to free locked-in natural gas deposits in New Mexico, created a 350-foot-high chimney of rubble beneath the earth when it was finally set off Dec. 10.

Atomic Energy Commission spokesmen said drilling during the next few weeks will yield samples of the gas and measure how fast the radioactivity from the explosion was decaying. After that, production testing, to see how much flow of natural gas had been stimulated by the blast, will begin.

Gasbuggy was the first test sponsored jointly by the AEC and industry to utilize nuclear explosives for commercial purposes. Other proposals in the works include two more natural gas experiments, tests to free shale oil and break up low-grade copper ore and an explosion to create an underground reservoir to store natural gas.

Sometime before April, the AEC hopes to resume the postponed Cabriolet excavation test, which was held up last February in order not to upset negotiations of the non-proliferation treaty. Cabriolet is one of a series of tests needed to develop nuclear blasting technology for canal digging.