tically nothing at the present time."

Sir Macfarlane Burnet writes in "The Integrity of the Body" that it is one of the "concise statements of modern immunology that the body will accept as itself only what is genetically indistinguishable from the part replaced." He says it is as if "the body can recognize its own individuality and will accept nothing that is inconsistent with that individuality."

Sir Macfarlane says most workers in immunology believe that the small lymphocyte must play a major part in immune processes. He takes the viewpoint that the lymphocyte is probably a carrier of genetic information; also that "any form of stress or, what perhaps amounts to the same thing, administration of large doses of cortisone and similar corticosteroid hormones, will sharply reduce the number of lymphocytes in blood and in the lymphoid tissues."

He points out that even the "most optimistic and courageously experimental of surgeons will find that nature fiercely defends the integrity of the body."

And, as Dr. Barnard knows, any attack on that integrity, in defense of a transplant, is an attack on the body's ability to survive totally unrelated infections.

Dr. Barnard and other heart surgeons expect to continue their efforts, while hopeful patients wait in line.

TRANSPLANTATION II

Ethical Problems Reverberate

While Louis Washkansky fought his losing battle against death in a South African hospital, an international panel of heart surgeons, meeting in New York, thrashed out the ethical implications of his heart transplant.

The American heart surgeon, Dr. Jacob Zimmerman of St. Barnabas Hospital, New York, told his colleagues from Switzerland and Great Britain, "I will never participate in such surgery." To which Dr. Donald Ross of The National Heart Hospital, London, a pioneer in transplantation of heart valves from the dead to the living, rejoined, "But you will, we all will."

Asked if a heart transplantation were imminent in Zurich, Swedish-born surgeon, Dr. Ake Senning replied with a reluctant yes. Dr. Senning, who has repaired defective valves joining the heart's left ventricle with the major body artery, the aorta, using connective tissue from the patient's hip, said he was most concerned about the physician's judgment as to when a patient's heart is fatally damaged or defective.

Neither he nor Dr. Ross felt that heart transplants posed a greater hazard of rejection by body defenses than do today's fairly common kidney transplants. In fact, they suggested that the heart is probably better able to withstand the attack of white blood cells and antibodies than either the kidneys or the liver.

But Dr. Zimmerman was more concerned with the donors. "It is medically and morally wrong," he said, "for us as doctors to stand by a dying patient's bedside hoping he'll get it over with quickly so we can grab his heart." The heart surgeon even envisioned a despotic ruler doomed by a diseased heart, ordering the execution of a political enemy to obtain the organ for transplant. "A million dollars," he continued, "could buy a patient almost anything—including a new heart."

Dr. Senning said that though there are many problems in obtaining donor hearts quickly, and even more problems in choosing among the many applicants for heart replacement, techniques already developed in Europe and the U.S. should give surgeons at least an hour between death of the donor and removal of the heart. (In the late 19th century, French surgeons removed the heart of a guillotined criminal, iced it, and then made it resume beating many hours after the execution, Dr. Ross recalled.)

Both Dr. Ross and Dr. Senning were optimistic that heart banks could be established by chilling and storing the organs from dead persons just as corneas, kidneys, skin and bones are stored today.

EARTH SCIENCE

Creation of an Island

A new island was created last month in an eruption of lava, smoke and steam spewing 4,000 feet high from the surface of the ocean. The outbreak of the restless earth was sighted east of Fiji Island in the southwest Pacific by the New Zealand freighter Tofua.

The new island is No. 7 Metis Shoal of the Tonga Islands, a volcano that rises some 3,300 feet from the floor of the sea. Until last week it had been submerged 10 feet below the surface of the water. Capt. Peter Bennett of the Tofua estimates the new island to have been half a mile long and 150 feet high when he sighted it building up from the sea. Further eruptions and the erosion waves and wind may change its dimensions.

Many sea islands are created, then washed away by further volcanic activity, waves and wind. This activity is constantly going on, but is seldom reported because it often takes place in remote ocean regions. Two weeks ago the ring-shaped volcanic island, Detection, erupted in the Antarctic Peninsula in the South Shetland Islands. The much observed new island Surtsey was created a few miles southwest of Iceland. It rose from the sea Nov. 14, 1963, and is now a substantial two-square mile island on which small plants are taking root. The world's most massive sea volcano is Hawaii, rising some 29,000 feet from the bottom of the ocean, perhaps the largest volcano of the world.

FROM BRUSSELS

Euratom Drops Out

On January 1, Euratom quit the fields of fast breeder reactor research and studies of fusion power, thanks to an intransigent France.

Euratom's budget for 1968 is a meager $40.6 million, less than half of last year's. This budget will cover Euratom's activities in the four Joint Nuclear Research Centers at Ispra (Italy), Mol (Belgium), Petten (Holland), and Karlsruhe (Germany).

Research into the second generation of proven water and gas-cooled reactors, treatment of irradiated fuel and radioactive waste, which were the main fields of activity in the just-ended Second Five-Year Program, will continue.

The budget for 1968 has now been accepted as provisional and a group of experts is being asked by the ministers responsible for science and technological research in the six member countries to study plans for a third quinquennial program. But it does not look as though any long-term program will cover anything like the range of activities formerly carried out by Euratom scientists.

All Euratom's association agreements (with individual member governments) and contracts (with national institutes and companies) were suspended at the New Year. Association contracts covered all the most advanced fields of research including fast reactors and the construction of prototypes. This research will now be continued by the national governments on their own or through a series of multilateral agreements, without Euratom's coordination and with no Community budget.

The root of Euratom's troubles was French determination to keep key areas of research to herself. The French were firmly supported by the Italians, who claim that their industry does not obtain sufficient contracts in view of their 23 percent share in the Euratom budget.

The French will doubtless be glad to say good-bye to Euratom's participation in the construction and operation of a sodium-cooled fast reactor at Cadarache in the South of France; France was, in any case, planning to go ahead on its own with a similar reactor. This reactor,

on which construction will begin in 1969, will have a 250 megawatt electric capacity.

The national approach to nuclear development in Europe has thus won out at least temporarily over the Community approach, whereby all members of the European Community were jointly involved in all projects.

The Germans, whose industry recently came around to the belief that the most effective method of bridging the technology gap was by integrated research in the framework of Euratom, was the most concerned at the heavy reduction in the scope of Euratom's activities. They have now signed a tripartite agreement with Holland and Belgium to construct a prototype fast reactor in Aachen.

At French suggestion, a group of national experts will now study future possibilities of joint research in non-nuclear fields (SN: 12/16/67). Suggested fields include the six areas proposed by the independent executive Commission at the Technology Council of the European Community last month—oceanography, metallurgy, data-processing, water and air pollution, transport development, and meteorology. Biology and reactors for ship propulsion were also mentioned as possible areas of integrated research.

In a paper to the Council of Ministers, the independent executive Commission has proposed studies for a European isotope separation plant. The Council clearly looked to France for help in this direction and to the extension of the French national isotope separation plant at Pierrelate in the South of France for the production of enriched uranium for civil use for the whole Community. The construction of such a separation plant would enable Euratom to produce for itself the enriched uranium hitherto supplied by the United States under the Euratom-U.S. Association Agreement of 1958. This is used as fuel for the second-generation reactors. But the French are unlikely to welcome this suggestion.

The Commission also declared that Europe is not behind the U.S. in nuclear research. Where it falls behind drastically is in the application of this research. The Commission is struggling to convince the member governments of the EEC of the need to use the results of Euratom's research in their industries, and to stimulate scientists, institutes and private companies by close cooperation and consultation.

But Euratom's scientists and civil servants are very gloomy about Euratom's prospects. The construction of a European isotope separation plant for peaceful uses is a very long-term project; for the forseeable future Euratom brithest hopes may be, ironically, in non-nuclear fields.