Heart transplants

Japan tries limited experiment

Tokyo

JAPAN's Ministry of Health and Welfare (MHW) is to back a major new project aimed at resuming heart transplants in Japan, almost 17 years after the nation's first heart transplant caused a public outcry and brought further attempts to a halt.

In August 1968, Professor Juro Wada, then at Sapporo Medical College in the northern island of Hokkaido, performed the nation's first heart transplant. Overnight, he gained much the same fame as Christian Barnard had in the west. But things quickly went sour. Although the heart recipient lived for 82 days, which was a considerable period of time given the state of knowledge in 1968, the press turned on Professor Wada — actually even before the recipient's death — and subjected him to savage personal criticism. A complaint was filed against him that the donor had not been dead at the time the heart was taken — the legal criteria of brain death having not been clearly established — and that he was thereby guilty of murder; but no prosecution was ever actually carried out.

What exactly lay behind this campaign of vilification is a complicated tale; regrettably, it was in part encouraged by doctors at more famous medical schools who had wished to claim the honour of the first transplant for themselves.

But something rather more illogical than envy was also important. There remains in Japan a peculiar and inexplicable opposition to organ transplants, to the extent that it is extraordinarily difficult to find heart, kidney or eye donors. Quite why this is so, nobody knows. Some say it stems from Buddhist beliefs about the interment of bodily remains: after all, each year there are several expeditions to sites of fierce Second World War battles, such as Saipan and Iwo Jima, to search for the bones of long-dead Japanese soldiers so that they can be brought back to the homeland. That bodily remains matter so much does seem to be rather cast into doubt by reports from the Railway Lost Property Office, however — each year around 15 Buddhist funeral urns are left on trains and never claimed.

Others seeking to explain opposition to organ donation point to a Confucian influence with emphasis on the notion that having been given one's body as a precious gift from one's parents, one is not free to give parts of it away. The absence of the Christian idea of charity may also be to blame; donating things to people one does not know or has no connection with is a custom only just beginning to take root in Japan. Also there is perhaps a tradition that sudden death is preferable to a long battle in a hospital. Again, the government has never made a serious attempt to introduce a "donor card" system. Most probably all these influences converge. But what adds a twist of further illogicality to the Japanese situation is that very recently a Japanese went to the United States and successfully received a heart transplant from a US donor. Press reaction was ecstatic, despite the fact that the very same newspapers criticize attempts to restart heart transplants in Japan.

One result of the unwillingness of the Japanese to donate organs has been a major effort to develop artificial equivalents. Japan now has the highest number of kidney machines per head in the world and relies upon them in 98 per cent of cases of kidney failure. In other advanced countries, transplants are carried out in 50–75 per cent of cases: without its own supply of kidneys, Japan has instead to rely on machines and US imports obtained at weekends and public holidays when few kidney transplants are carried out in the United States.

Artificial heart research is also very advanced. The group at the Tokyo University Institute of Medical Electronics, headed by Professor Kazuhiko Atsumi, is a world leader with a record-breaking goat that stayed alive for 344 days with a totally artificial heart. Groups at Osaka, Kyoto and Fukushima follow closely behind. Artificial hearts are at present driven by an external source of compressed air but the Tokyo team believes a totally implantable compact heart with its own power supply could be ready for animal testing in 3-4 years and a finished product in ten years.

Final development of an artificial heart will occur, though, only if heart transplants also become common in Japan, for their first use is likely to be to keep a patient alive until a suitable donor heart can be found. The new MHW projects will try to win consensus for resumption of transplants; indeed, it is already rumoured that several transplants will be performed this year. A hundred million yen has been promised by the ministry: first goals will be to collate information on heart transplants throughout the world to help win over public opinion. Opinion has already been sounded in the medical profession and 90 per cent of doctors in medical schools are now willing to accept "brain death" as a criterion of death. Two hundred doctors have joined a society for heart transplants and 300 that for artificial hearts, both established very recently. Research will then be promoted on transplants in animals, organ preservation, a rapid distribution system for donated hearts, immunological control mechanisms and artificial hearts needed to back up operations.

Even if a national consensus can be won, it is still unlikely that Japan will ever be able to supply all the organs it needs. Unlike the United States, there are just not enough young people dying violent deaths or being killed in traffic accidents to supply the organs required. **Alun Anderson**

Hannover Fair

Endless shop-window

THIS year's Hannover Fair, to be held in West Germany from 17 to 24 April, will be the biggest ever, with more than 6,700 exhibitors from 46 countries. Last year, 740,000 visitors attended in the eight days of the fair and considerably more are expected this year. The demand for exhibition space has now so far outstripped the provisions of the site that from 1986, the office and data technology fair will be held separately, three weeks earlier, to allow other parts of the fair further room for expansion.

The largest trade and industry fair in Europe, Hannover is known as the Fair of Fairs, because it is made up of ten separate trade fairs run concurrently. By bringing together so many aspects of industry, ranging from microelectronics and robotics through electrical and mechanical engineering to cleaning technology and waste disposal, a great opportunity for cross-fertilization is provided. Nowhere is this more apparent than in the research and technology exhibition, unique to Hannover and one of its most popular attractions. Behind this innovation, started in 1976, is the concept of horizontal technology transfer — that many solutions to specific problems can have much wider applications than their inventors ever conceive of. A good example is the inventor of the air pump, who surely never foresaw that it would become an essential part of the compressor in millions of refrigerators. The exhibitors displaying such developments can attract an enormous range of potential customers, who in their turn have the chance to discover solutions to technical problems that have been impeding their development of new products.

This year, for the first time, foreign universities will be exhibiting, in addition to 46 German universities, technical colleges and research institutes. Here, demand for space has now outstripped provision by 30 per cent, and next year the research and technology exhibition will be housed in a far larger hall. The concept of "researcher" also has to be seen in a wider context than those working in laboratories and research institutes, as many individuals now exhibit their specialized technical inventions at Hannover, hoping to find a manufacturer interested in large-scale production.

A further development of the technology transfer concept is the new biotechnology exhibition, BioTechnica, to be staged for the first time on 8-10 October 1985. Eighty or more exhibitors from Europe, the United States and Japan will show marketable biotechnological research findings, new products and methods as well as laboratory and production techniques necessary for the practical application of their developments. **Jennifer Altman**