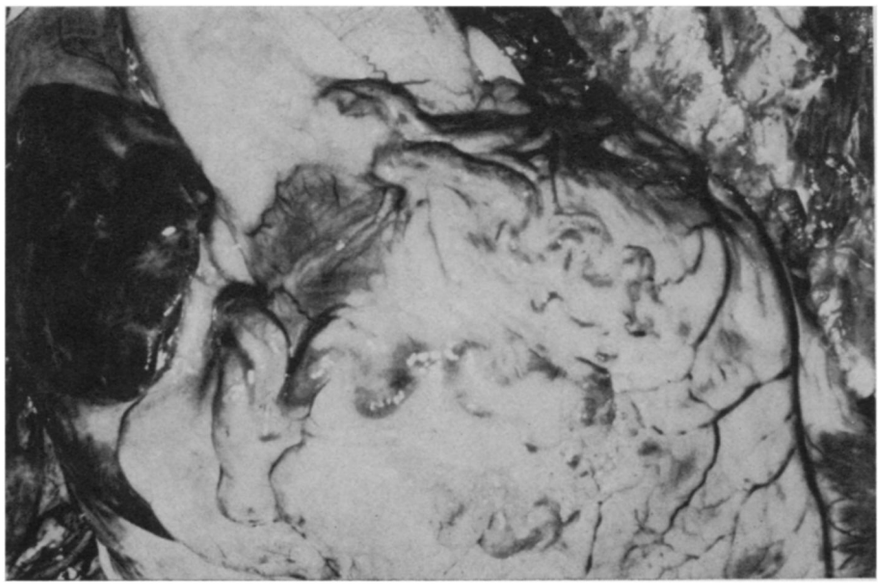

Georgetown University

A human heart as it appears in the body with enlarged arteries above left.

First human hearts transplanted

When Dr. James D. Hardy of the University of Mississippi transplanted the heart of a chimpanzee into a dying man in January 1964 the operation was a success but the patient died. The chimp's heart was too small, and the man lived only two hours.

Dr. Christian Barnard of Groote Schuur Hospital, Cape Town, South Africa, who on Dec. 3 transplanted the first human heart into the chest of a patient doomed if he retained his own damaged organ, used a smaller heart taken from a 25-year-old woman who had just died as the result of an auto accident.

Dr. Barnard says he got around the size problem by cutting the woman's heart vessels on an angle. In this way the larger area of the patient's vessels could be sutured without difficulty.

Days later, Dr. Barnard's patient, a 55-year-old grocer named Louis Washkansky, was still living, but the most optimistic surgeons were taking the attitude of "wait and see."

Dr. Charles A. Hufnagel, a Georgetown University heart surgeon noted for developing heart replacement valves, said Dr. Barnard's transplant was "very interesting but not too significant."

He said the problem is not in doing a heart transplant but in keeping the heart functioning for a long time. The mechanics of performing a human transplant "have been well established in this country for at least 10 years." But doctors in the United States have not been willing to take the chance.

The average life for a heart transplant in dogs is 7 to 30 days and from the beginning Dr. Barnard and his coworkers were aware that the heart of Denise Ann Darvall could in time be rejected by Washkansky. But since the man would have died without the transplant they felt justified in making the attempt.

Two teams working simultaneously were required to make the transfer. Both Washkansky and Miss Darvall's body were put on heart-lung machines that kept the hearts pumping and provided oxygen normally coming from the lungs. Miss Darvall's blood and tissue had been typed and found compatible with those of Washkansky. The moment of her death was determined by an electroencephalogram whose waves flattened out. Both she and her mother had been struck by a car as they crossed a Cape Town street. Her mother died instantly. The consent of Miss Darvall's father to remove his daughter's heart had been obtained.

Every action of the two teams was familiar: they had had practice in an animal laboratory. Miss Darvall's heart was removed first and kept beating by a pump while it remained cool and perfused with blood.

When Washkansky's heart was removed, Dr. Barnard says he left parts of the right and left atria in the back wall to make fitting and sewing the donor heart easier.

Washkansky was given anticlotting drugs as well as Imuran and prednisone, which reduce the formation of antibodies that fight foreign tissue. After the transplant he was given radiation.

The actual operation with its minimum suturing was described by a surgeon at George Washington University Hospital as a "real technical feat."

The surgeon, who asked that he not be identified, said he anticipated that Washkansky would have to have a pacemaker implanted to keep his heart beating rapidly enough for him to perform useful work.

Dr. Barnard says, however, that he had given the transplanted heart a single electric shock, and that for the first few days, at least, it had been beating regularly.

Dr. Barnard, who is 44 years old, was a friend of Dr. Norman E. Shumway of Stanford University when both were at the University of Minnesota in the 1950s. It was Dr. Shumway who stated as recently as last month that "the way is clear for transplanting a healthy human heart into the body of a person with a diseased heart," (SN: 12/9) and that the "ideal donor would be a relatively young patient dying of causes unconnected with heart disease." He said "if the heart can be removed within a half hour after the donor's death it can be resuscitated without damage."

Dr. Shumway and Dr. Adrian Kantrowitz of Brooklyn were both prepared to do transplants similar to the one done by Dr. Barnard when the occasion arose and the proper donor was found.

Three days after Dr. Barnard transplanted the first human heart, Dr. Kantrowitz at Maimonides Hospital, Brooklyn, headed a team of surgeons who transplanted a heart into a two-and-a-half-week-old boy whose heart was defective. The donor heart was taken from a mentally defective baby who had just died in the early morning hours of Dec. 6. The two-hour surgery was completed at 6:30 a.m. and for several hours the baby's breathing and blood pressure were normal. But the baby died at 1:00 p.m.

A spate of heart transplants can be expected in some half dozen medical centers of the United States. Surgeons at Philadelphia's Hahnemann Medical College and Hospital appealed for heart donors shortly after the Brooklyn transplant.

Other surgeons, including Dr. Harris D. Schumacker of the Indiana University medical school in Indianapolis, have been working with artificial hearts that have been successfully tested in animals but have never had trials with humans. Such trials could come soon. ◈