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rector of surgical research there, Dr. Kao worked out an ingenious method for plugging brain material into a damaged spinal cord and, according to the claims, regenerating nerves with functional capacity.

The experiment has worked on five out of 36 dogs, says Dr. Kao. He was not, however, successful with either monkeys or cats.

It was necessary, says Dr. Kao, to take pieces of brain material from the animals—he took out small bits with nerve cells from the cerebellum and cerebral cortex—and to culture them for six days. The cultured brain material then worked somehow to stimulate spinal regeneration.

Dr. Kao also tried to culture brain material taken from humans in brain surgery, but the explant wouldn't grow. He believes, however, that a method

of maintaining human cultures will be found. If all goes well medically, and that is now a very large question, Dr. Kao's technique would raise all kinds of legal problems, not to mention ethical ones. A paraplegic would have to undergo brain surgery that he did not need for an explant to plug his spine.

Transplanted material between two dogs doesn't work, says Dr. Kao. "If you put one dog's brain material into the spinal cord of another, the material dies and a scar forms. The cord will not regenerate." He tried this technique unsuccessfully on five animals using immunosuppressive agents that had no effect whatsoever.

Of the five successful cases, one dog walked very well for two to three months until it was sacrificed, says Dr. Kao. The other four were unsteady.

Patricia McBroom

THE LAW AND THE FLESH

Whose body is it?

By long-standing tradition originating in English common law, after death a man's body belongs to his heirs. Even if he wills his body to research or his heart to a transplant patient, his family can forbid it.

The need to resolve the legal tangle of body ownership, which has always been a concern to scientists using cadavers for research and teaching, takes on new urgency with major advances in transplant surgery in the last decade. These surgical advances also raise the need for a legal definition of death.

"It now seems that the social interest in transplantation justifies certain specific legislation regarding both a definition of death and authority to donate organs," Prof. David W. Louisell of the University of California School of Law at Berkeley says.

Laws governing organ donation, widely judged inadequate by scientists and lawyers alike, vary greatly from nation to nation and state to state.

England adopted a Human Tissue Act in 1961 allowing prior donation, but heirs remain at liberty to reverse the will. Since 1947, France has had a law permitting physicians to remove any organ immediately after death without consent of next of kin.

But most scientists doubt that the United States could have such a broad law for years. Dr. Carl E. Wasmuth of the Cleveland Clinic Foundation comments: "In the U.S. the sanctity of the human body is still the feeling of the people. This is going to be a matter of education for the public."

On the other hand, a recent Gallup

poll revealed that 70 percent of persons questioned said they would gladly leave their bodies to medicine.

At the present time, prior organ donation is legal in 31 states in the U.S.; nevertheless, most physicians are hesitant to remove organs without specific permission from a dead man's relatives. California and Pennsylvania, for example, have laws that say if a man wills his body, physicians can remove organs without any further authority. "But, cautions Prof. Louisell, "These laws have never been tested in court and until they are, we're on shaky ground."

There are several movements afoot to clarify and standardize the laws governing disposition of dead bodies.

A Commission on the Ethical and Social Implications of Health Science Research and Development is proposed in bills pending in House and Senate.

The National Conference of Commissioners of Uniform State Laws is drafting a model law for willing organs before death. One idea is that organ donors could carry a card, similar to the one eye donors now carry, identifying themselves so that their organs could be removed by any authorized surgeon in any state at the time of death.

But such a proposal represents the ideal some lawyers and scientists don't believe will be realized at all soon. Even a modified advance in the legal situation would be valuable, they say. What they'd most like to see eliminated is the provision that virtually any near kin can nullify a donor's will. A man's widow, for example, has first authority

(Continued)

in the matter, but objections to organ donations coming from parents, sisters, brothers and children all have to be honored. And many surgeons tell stories of the bribes demanded of them before widows would comply with their dead husbands' expressed wishes.

Two important components of any new law, whether federal or state, should be one to assure that potential donors are not pressured by physicians into willing their bodies, and one to assure that only qualified personnel in authorized hospitals be allowed to remove organs—a measure intended to prevent growth of a black market in human spare parts.

The other major legal question transplant surgery raises is, perhaps, more complicated than the matter of willing organs. It calls for a definition of death. The traditional, but non-legal, idea that death occurs when the heart stops beating is losing relevance as electronic means of keeping the heart functioning improve. And this criterion is a major handicap to transplant surgeons who need to remove the donor organ from the dead man's body before or soon after the supply of oxygen is cut off.

If a body is all but dead, technically alive only because an artificial respirator maintains heart beat, is it homicide to take out a heart or kidney before pulling the plug? The law has no answer, but physicians are urged to err on the side of caution. Legal precedents offer little help.

In one case in England, a man from Newcastle who had fallen backwards and injured his head was connected to an artificial respirator some 14 hours after hospital admission. Twenty-four hours later, with his wife's consent, physicians removed his kidney for transplantation, and the man died as soon as the respirator was disconnected after the operation.

At the inquest, a medical examiner testified that the patient-donor died of cerebral damage from his fractured skull, not from loss of his kidney. The jury acquitted the surgeons of responsibility. "But," Prof. Louisell warns, "this is only one case."

Ethical as well as legal problems emerge. The Hippocratic Oath, the 1947 Nuremberg Code and the 1964 international Declaration of Helsinki all affirm the physician's prime responsibility to his patient is that he must do no harm. And removing an organ from one man to give it to another constitutes harm in most cases, if the donor is alive. But the medical profession and society have to come to some decision about when life ceases. If heart beat is no longer the deciding factor, should brain function be the criterion?

Barbara J. Culliton

ideas OF THE WEEK

An editorial service to readers; more information on items can be secured from the manufacturers.

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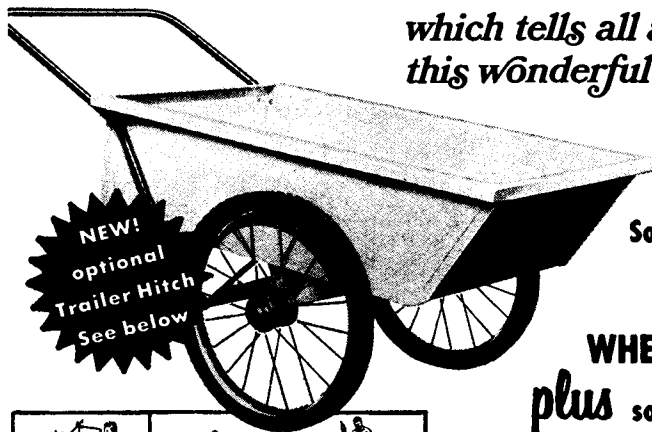
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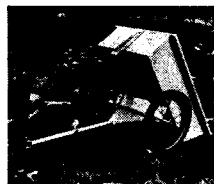
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