

ARTIFICIAL PROLONGATION OF LIFE

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"Science has made us gods, before we are even worthy of being men"

THESE words of the French biologist, Jean Rostand, though enjoying a wide application, fall nowhere with more disconcerting accuracy than in the field of artificial survival.

Exactly one month ago, a human being lived without a heart for more than two and a half days: inside his chest was a pump made of plastics and other synthetic materials. The power to operate it came from outside the body in pulses of carbon dioxide gas. This gas drove the pump. The pump kept blood circulating through all the arteries and veins of the patient's body and for sixty-five hours it maintained his life.

This event represented one further important milestone in the artificial prolongation of life. No human being, nor indeed any animal has ever survived as long with an artificial pump totally replacing the heart. Yet, along with this achievement, something akin to a squabble arose.

Milestones and squabbles have both become familiar happenings with the practice of maintaining vital life functions by artificial means, and in particular with regard to human heart transplantation. The milestone in this case was the proof that an artificial heart device, totally replacing the natural heart, can actually give surgeons some relief from the pressure involved in finding a heart donor who has died at the very time a heart transplant may become imperative for a dying patient. The squabble in this case had many facets: of importance was the question of the ethics involved in what may be viewed as human experimentation.

But how is experiment distinguished from an urgent procedure which is performed as the only available answer to a life-and-death emergency? The distinction is far from clear, if indeed in this case it exists at all. What is clear is that the artificial pro-

longation of life in these circumstances imposes heavy responsibility.

But a similar responsibility accompanies a vast range of situations which are far less glamorous and newsworthy, but which are common in practice and which are no less dramatic for the relatives, and certainly no less important for the patients. These are the events involving resuscitation after cardiac arrest, electrocution, drowning, poisoning—especially with sedative drugs, anaesthetic accidents, extreme anaphylaxis, severe trauma including burns, in fact any illness or insult which is severe enough to interfere with the function of vital organs, and which requires the application of special devices, drugs and activities to ensure the minute-to-minute or day-to-day survival of the patient. The common devices are mechanical ventilators to assist respiration, electronic equipment along with an ever increasing array of powerful drugs to assist circulation, and the artificial kidney. Today, on most occasions, the artificial prolongation of life is unspectacular, arouses little comment, and is achieved by measures which are in no way ordinary but are commonplace and comprise routine therapy. As examples, there are the patients with diabetes, Addison's Disease, myxoedema or myasthenia gravis, whose lives are prolonged with specific medication. With skilful control, parenteral forms of nutrition now support near-normal metabolic activity for months on end even when all alimentary feeding is precluded. The transfusion of blood and blood derivatives is a common therapeutic event today and is frequently the means of supporting and prolonging lives. But despite the complexities of technique and sophistications of administration with up-to-date parenteral nutrition and transfusion therapy, these extraordinary measures are found and expected wherever modern general hospital practice is available. And it is possible to mention other agents which serve to prolong life such as the immunosuppressive and cancer chemotherapeutic drugs, and a host of others again.

And bearing in mind that all these situations are pretty much every-day fare compared with heart, lung, liver, kidney, spleen, small bowel or endocrine gland transplantation, have the responsibilities they impose emerged in as well-defined, in as ordered, and in as pedestrian a manner?

For nearly twenty years now, many of the problems stumbled over in the course of maintaining a life artificially have remained firmly underground. Questions which by now should have been

answered, or at least aired, simply have not been revealed. The decision to actively prolong life artificially or to passively allow death to occur quite properly has been left to the individual medico. But many times he has been of junior status and with no previous experience of the situation. For him and for others, overt and accessible guidelines have been few and, from a practical angle, unrealistic.

Recently, however, the occurrence of two practices in particular have made it necessary to examine more closely the question of the time of death, to define more clearly criteria of human life, and to re-appraise the principles underlying the clinician's responsibility in attempting to prolong threatened life. They are:

The ability to maintain by artificial means the circulation of oxygenated blood through tissues of the body which may have been irreversibly injured, and

The use of cadaver organs such as heart, lungs, liver, kidney, spleen and small bowel for transplantation.

But the occurrence of these two phenomena has not been recent: both have been practised, though not so expertly nor so inclusively as at present, for nearly twenty years. There is little doubt that we have been made to get a "wriggle on" through the popular press bringing a new set of ideas and perplexities to the general public.

Death, like old age, now must be regarded as a disease: a very serious disease, and generally fatal, but not necessarily incurable. There are many kinds and degrees of death, and it is well known that some of the milder and earlier cases are amenable to treatment: hundreds of people have been resuscitated after drowning, electrocution and heart attack. There are many people living today who were corpses temporarily, and who in former times would have been corpses permanently. The distinction between life and death used to be simple and obvious:

a living man breathes, eats and makes stupid remarks;

a dead man just lies there, pays no attention and after a while decays.

Is death the sudden onslaught of nothingness in that fleeting moment when the spark of life, the soul, leaves the body?

Or can death be half-a-death, slowly creeping through the body until it reaches a point of no return, after which life no longer can exist?

From ancient times, man has dreamed of escaping death and the effects of old age.

Ponce de Leon, pursuing rumours of a fountain of youth, discovered Florida. In Gounod's opera, *Faust*, embittered by age, made a pact with the devil to regain his youth.

Will we ever be able to defer or eliminate old age and death?

Despite an increase in average life expectancy of those born today, man's maximum life span has not changed substantially throughout history. The upper limit on longevity varies from race to race and from one individual to another, but it rarely exceeds a hundred years.

Aging is caused by the deterioration of DNA (deoxyribonucleic acid) in the cells. The proper functioning of all the body's cells is controlled by their DNA. DNA, like the magnetic tape in a tape recorder, not only stores chemical instructions for the cell's function, but the tape can reproduce itself, providing duplicate archives of information for its daughter cells. In this way, DNA provides for continuity of function, not only from one generation to the next but throughout the life span of the individual.

If information, coded into the DNA of a cell, becomes garbled, the cell may no longer be able to function and dies. In man this may lead to impairment of the entire body. Or the damage may affect the control mechanism that tells the cell when to stop subdividing, leading to malignant neoplasia. Another form of DNA damage causes the cell to manufacture substances harmful to the body, leading to heart disease and other ailments of the aged.

It is possible, perhaps, to treat human DNA to make it more stable and arrest its deterioration.

No such treatment is at present available, and its discovery could not turn back the years as once the coded information of the DNA has become garbled, it would be too late. It would not, as Ponce de Leon hoped, make us young again but for those who are still young, it would defer the effects of old age. The ageing process has been likened to "planned obsolescence", in that every cell of the body is 'programmed to die'. This is applicable to all life, and in the case of microscopic animals it is possible to shorten or lengthen their life span by modifying the environment—for example by raising or lowering temperature. The animal in these cases may 'live faster' or 'live slower', but essentially its life-span is fixed.

Today, "legal" death, "theological" death and "physical" death are all recognized. Yet lawyers, priests, clinicians and biologists have done little more than observe when "the soul has left its mortal dwelling". In medicine, the realm of over-specialization, it is surprising that there are no "necrologists", specialists in death, as death itself is a significant event destined to come as a conclusion to every patient's medical record.

A new educational organization, the Foundation of Thanatology has recently been established in New York, but it is primarily concerned with the psychological problems of dying and bereavement. Death is a social impropriety, a taboo of all times and almost all peoples; death is a fearful event that it is more convenient not to think about.

"The weariest and most loathed worldly life
That age, ache, penury, and imprisonment
Can lay on nature, is a paradise
To what we fear of death." Wrote Shakespeare.

And Browning said,

"Fear Death? To feel the fog in my throat,
The mist in my face."

Until recently, a clinician pronouncing a man dead or more cautiously, apparently dead, established his diagnosis on notions which were both foggy and misty.

There are three kinds of physical death:

Clinical death or ordinary medical death used to be characterized by cessation of circulation and respiration. These criteria are no longer tenable. Now, the total and irreversible abolition of cerebral function, in other words, death of the brain, is our criterion for death of the organism as a whole.

Biological death is that degree of damage and disorganization from which the body as a whole cannot be resuscitated by the present resources of medicine.

Biological death depends not only on the state of the body but on the state of medical art. So that today's cadaver may be tomorrow's patient.

This is the philosophy behind the lay-by plan for immortality, currently gaining popularity in the United States of America, "Die Now, Freeze, Thaw Later", the cost?—around \$250,000.

Cellular death refers to irreversible degeneration or disorganization of the individual cells of the body. Cellular death

is usually not complete until at least two days after clinical death.

Clinical death may be diagnosed by:

- Complete absence of awareness and response,
- Complete absence of muscle tone and reflex activity,
- Complete absence of spontaneous respiration,
- Complete absence of systemic blood pressure, and
- Complete absence of brain waves (iso-electric electro-encephalogram).

These criteria do not apply with young children, with hypothermic patients, nor with victims of acute poisoning; and in cases of brain injury, a flat EEG is not enough: there must be gross anatomical damage visible on physical examination, by craniotomy or by angiography; there must be something that can be seen by the unaided eye which tells the observer that the brain is damaged, extruded, divided or destroyed along with the total cessation of neural activity. But in these circumstances, even if the heart is still beating, there is no question for the coroner or the lawyer—the individual is dead.

So that death no longer appears as a clear-cut event extinguishing all living function at a single stroke. It can extend over a considerable period of time and affect different parts of the body one after the other—death by degrees; it is a process and not a moment in time as the law believes. And it is therefore no longer absurd to enquire whether a decapitated person, whose heart, lungs and kidneys are maintained artificially, should be regarded as dead or alive. Of course, the decapitated person with his artificially maintained bodily functions is not alive.

Under no circumstances can the law determine death. Physicians must do this for society and then provide the common-law grounds for action. The law clearly recognized that the pronouncement and the certification of death are the responsibility of a physician. The law is only secondarily involved: once death is certified by the physician, then the law operates to dispose of a deceased's estate. The law also operates to challenge a physician for performing unscientific treatment or for negligence.

As long as the death of the brain is unproven, it is the physician's duty to carry on resuscitation as far as the circumstances permit: that is to say, resuscitation is indicated for occurrences like cessation of breathing or circulatory collapse, but not for hopeless conditions such as inoperable cerebral tumours, where prolongation of life would be more correctly called prolongation

of the death struggle with the patient finally degraded to a "parasite" of the respirator. Resuscitation should be abandoned and the mechanical support of vital functions discontinued when all reaction to environmental stimuli has ceased, when "the person has gone". The important thing is the person, not the mere organism.

In the unconscious or hopelessly ill patient requiring resuscitation, three courses of action are available:

Active treatment, resulting in artificial prolongation of life, cure or protracted dying.

Active intervention to end life, euthanasia.

Passive management, omitting an act or acts and permitting nature to take its course thus shortening the dying process.

Despite his traditional duty to preserve life as long as possible, there are times when the doctor must take the responsibility for giving up a useless struggle. And in so doing, the clinician should not be held morally or legally guilty of any wrongdoing. Yet the legal situation is far from clear.

There is a distinction in many legal systems between crimes due to deliberate action and crimes of omission. Thus if a man kills a sufferer for reasons of mercy, this is an active crime and legally a malicious one. As regards the law, this is murder, though juries have traditionally failed to convict doctors for putting an end to the sufferings of patients. Certainly, no layman or doctor has been convicted for omitting to take steps that could have averted death. In this respect, there may be a difference in some legal systems between failure to respond to the call of a stranger and failure to treat a person already in the physician's care. There is a further difference between active and passive behaviour: a doctor may not actively kill because the prohibition of actively killing applies to all men; however, death due to a failure to give aid to a patient—passive behaviour—involves a special relationship between doctor and patient.

The problem in taking the decision to stop resuscitation is whether the activity of turning off the respirator or removing the intravenous therapy are to be regarded as acts terminating life or omissions to render aid to sustain life. If turning off the respirator is "an act" under the law, then it is forbidden; if it is an "omission" the analysis is more flexible.

Legal authorities apparently have no basis for determining whether turning off the respirator is an act or an omission. The activity of switching off is really one of permitting death to occur

rather than causing death and the case is therefore one of omission. Not all omissions are illegal; the problem is to determine which are. The enquiry about the legality of turning off a respirator is answered by saying that it depends on what doctors customarily do. In other words, doctors are in a position to fashion their own law to deal with cases of prolongation of life. And though basic principles remain the same, medical customs change so rapidly that legal formulae tend to lag behind and to become out of date.

There must be very few doctors who have not from time to time felt uneasiness, perhaps even revulsion at the sight of some stuporous elderly patient in hospital being maintained in a state of suspended animation by all the sophisticated paraphernalia of modern resuscitation. But it is easy to say that such patients would be better dead, and that if we ourselves were in that unhappy position we would ask the doctor, or would already have asked him, to allow us to die without interference. What is more, it is easy to have the same feeling about the hopeless psychopath or the imbecile. To dispose of such unfortunates out of hand would be entirely reasonable in a society that was biological and nothing more. Once we accept that it is not our duty to try and keep all our patients alive, the principle—or lack of it—has an unfortunate habit of proving almost indefinitely extensible, not only to patients but to other members of society. Certainly history shows the ease with which it can be extended to one's political opponents or those of a different colour or religious persuasion.

Some medicos and laymen have suggested that patients over a certain age should be rejected as candidates for resuscitative measures. Here I agree with the healthy octogenarian lady doctor who protested against a fixed drawing up of age groups, and I suggest to you that a young man is one whom a pretty girl can make happy or unhappy; a middle-aged man is one whom a pretty girl can make happy but no longer unhappy; and an old man is one whom a girl can no longer make either happy or unhappy. With women it is quite otherwise. A woman's declining years are under twenty-five: she rarely declines after.

It is possible to recognize two different categories of human death, on the one hand, accidental, premature, "pathological" death, and on the other, natural death—a normal event occurring almost at a fixed time, like puberty or the menopause; and in theory, the doctor's duty is clear: he need not "strive officiously to keep alive" and should not stand in the way of natural death;

his task is to postpone or prevent pathological death, the death that comes before its time.

For example, in the situation of cardiac arrest occurring in the immediate post-operative period of routine surgery, the decision to resuscitate and prolong life is easy as there is the prospect of complete recovery if the acute emergency can be dealt with. The techniques of resuscitation are proven, sound, and legitimate, and in artificially maintaining life we are buying time, time for the patient's natural recovery processes to act, time to allow natural restoration of functional organization and time for other measures which may be indicated to act.

The decision becomes harder in other situations as when the matter of permanent renal dialysis is considered due to the limitations of facilities and of financial support; or in the case of a child ill with leukaemia. The physician may be besieged by the distraught parents to keep trying, to try anything. Again the popular press encourages this kind of attitude. Headlines frequently assure us that new cures not only are being sought but that many are close at hand. Is the physician to deny these parents a last chance or at least the feeling that they have "done everything"?

And what is to be done with the common problem of the patient with a long-term, disabling, hopeless illness, or one whose mental capabilities are far below normal. Life may hold nothing for them now or in the future except suffering or sub-existence. In the event of an acute life-endangering episode occurring in such a patient, is the clinician obliged to use artificial means to tide the patient over this unrelated, finite attack and so prolong his poor quality life? The artificial means may be strictly speaking, extraordinary but routine and readily available in hospital practice. Is the mentally-defective patient who is shocked with septicaemia to be given antibiotics and full-scale intensive care? Is an elderly cripple in constant pain to be transfused energetically for bleeding oesophageal varices?

These examples are so different from the "young for her years" eighty-five-year-old who suffers an easily remedied cardiac arrest in recovery room following cholecystectomy, or are they?

If we are to justify the techniques of resuscitation we must surely consider the quality of the life being prolonged. The nature of the resultant life must not be mere biological existence of several organs but integrated functional existence at a rational human level. But if we are going to judge what is poor-quality life and therefore not worthy of being prolonged, there is a danger

of creating opportunities for unscrupulous acts. For me, this problem constitutes the major dilemma of resuscitation.

Quite the opposite holds for euthanasia: there is no dilemma. Euthanasia has as its object the shortening of life, and this contrasts with passive management which has as its objective the shortening of the dying process. With euthanasia, one directly causes life to end by an act and permitting nature to take its course. The direct, overt act is abhorrent and prohibited even though there may be a good intent. With euthanasia, the motive may be mercy, but regardless of the intent, whether malice or mercy, the end is murder.

An English doctor tells of a colleague of his who, in the first stage of cancer, extracted from the friend who treated him the promise to give him a fatal injection when things got bad. Things became bad, and the patient, frightened and suspicious, refused to have even the injections which would be ordinarily prescribed.

By far the happiest course of action, if occasionally not the most prudent, is active resuscitation where increasing success in the situation of potential pathological death is due to the development of special techniques in,

- artificial respiration,
- artificial circulation,
- correction of metabolic acidosis,
- electrical termination of arrhythmias,
- enhancement of cardiac action by drugs, together with intensive care observation and management.

But whatever the medical course of action, there are three determinants which clearly outline the scope of our responsibility:

Firstly, there is the contract between doctor and patient in which care is implied and in which the patient expects the physician to do everything for his benefit. The doctor must respect the patient's rights and at the same time pay regard to the legitimate claims of society.

Then there is the guidance given to the physician by his code of ethics. These are set out in the Hippocratic Oath, the Declaration of Geneva of the World Medical Association of 1948, and the Nuremberg Code of 1947, all of which embody the universal rule, "Love thy neighbour; do unto others as you would have them do unto you".

Finally, we are all constrained by our limited knowledge and

our degree of competence in attempting to apply the science and art of ideal medical practice.

These principles are not new—they exist and have existed wherever orthodox medical practice obtains. But due to the recent explosive advances in medical knowledge and technical skills, a renewed and penetrating look at the morality of our practices and procedures is warranted.

In considering the ethical problems raised by organ transplantation, it must be emphasised that here the doctor has a double responsibility—to the donor as well as to the recipient.

New treatments and new surgical procedures have been surrounded by ethical problems since the introduction of general anaesthesia in 1846 and perhaps even before then. Here, there are a number of specific guidelines which make the new operations scientifically acceptable and it is reassuring to note that the same factors make them ethically sound:

The surgeon must have a long personal experience with the disease involved and with the experimental aspects of the proposed operation.

The surgeon must be supported by a team of informed clinical scientists.

The institution in which the surgeon and his team work must provide the appropriate atmosphere and facilities for clinical trail-blazing.

There must be a careful attempt to explain the variables of the procedure to the patient and to give him alternatives.

With regard to the donor, if he is a living person, then a significant injury is produced to help another person suffering from a severe disease. This relationship is unique in all history of medicine and surgery. Donors must obviously be carefully selected and well cared for. In the case of kidney transplantation, the live, closely-related family donor with good tissue cross-match, and with the use of an anti-lymphocytic globulin, gives the recipient the best chance of success.

The question of the dead donor, though attracting wide publicity, is probably the least troublesome of all the ethical problems involved. The determination of the moment of death is not so difficult, and depends upon a clear understanding on the meaning of a dead brain.

Two independent teams of medicos are required: the first team has the responsibility of deciding that medical treatment

is of no further avail in view of the total and irreversible loss of cerebral function; the second team has the responsibility of carrying out all phases of the actual organ transplantation.

It seems only right both to doctors and the public that the benefits of medical progress should eventually become available to everyone. Among different people of differing political beliefs, in the concept of the ideal society, it is agreed that all members of the community should enjoy the best possible available treatment. But this is an illusion. Many achievements of modern medicine are so expensive to apply that their use must be restricted. The most obvious example is the "artificial kidney".

Patients with chronic renal insufficiency can be kept alive for years capable of working and enjoying life, providing that their blood is cleared of metabolites by extracorporeal dialysis every four or five days.

At least in theory, nobody need die of renal failure today, but in practice only a small number of such patients can be saved with the artificial kidney. To help them all and prolong their lives by an average of perhaps ten years would require one thousand dialysis centres for the treatment of twenty thousand patients during the next decade—in Australia alone.

So we must come to terms with a new and disturbing situation: certain technical developments capable of preventing death from otherwise fatal diseases are so expensive that they cannot be made universally available without a radical readjustment of the national budget.

It is a difficult and a gruesome task to decide who is to be saved and who is to be regarded as expendable. Should a person's usefulness to society be a criterion? There are so many differing points of view as to what constitutes usefulness. I am reminded of a ship-wrecked party of two Italians and an Italian woman, two Frenchmen and a French woman, two Englishmen and an English woman and two Russians and a Russian woman. These twelve were stranded on a desert island. By the third day, the following situation had developed: one of the two Italians had murdered the other and had settled down with the woman. The two Frenchmen had come to an amicable arrangement and had settled down to a *ménage à trois*. The two Englishmen had murdered the woman and settled down. And the three Russians had drafted a letter to Moscow asking for instructions.

It is the physician or physicians who must decide who shall have his life prolonged by treatment, and who must die as decreed

by destiny. Committees are no substitute for a physician's decision. A committee may reasonably decide whether or not a research project should continue, but a decision concerning a patient is an individual decision and depends on variables that cannot be enumerated beforehand. Some, indeed would be difficult to put down on paper.

The doctor is responsible for his decisions, and in making them, he must be guided by his view of the general good in relation to respect for the individual patient.

Discussion

PROFESSOR P. L. WALLER: I want to concentrate briefly on one question, the question of the moment of death. We have to ask ourselves, as lawyers, why do we want to know when that moment occurs, and I suggest to you that our reasons may be different according to the context in which the question is being asked. One context, of course, and I think the most significant one has to do with the law of homicide. The law of homicide provides that only certain people can be victims, and for generations now, and it is still true today in this State, that those who can be victims of homicide are "reasonable creatures in being". The law has directed its attention to the beginning of life for the purpose of drawing one of its famous lines. Once crossed, it brings a person within the category of a reasonable creature in being. The lawyers here will know, and it is, perhaps, an effrontery on my part to mention it, that it is only those who are completely born, completely extruded from the mother and with an independent life system operating who can be victims of the law of homicide. True it is that we now have crimes like "procuring an abortion" and "child destruction" which take into account living creatures destroyed before the line is crossed, but these are recent developments, at least in the law's continuum, and the victims of "abortion" and the victims of "child destruction" are not the victims of "homicide". We have not paid much attention to the other end. We have not had to, except in hypotheticals dreamed up by law teachers seeking to test the wits of their students, asking questions about the responsibility of the person who plunges a knife into the body of the man already dead. But I think that it must be a lawyer's question if he is asked in a legal context to determine when a person is dead. If a person is dead, he cannot be murdered or the victim of manslaughter. It is as simple as that, and it is very important for doctors and those associated

with them to be free of this Demosthenes' sword of possible responses, even if it can be said, as I think it can be, that there is no real chance of an active prosecution in many of the circumstances that have been outlined by Dr. Galbally, no real chance until some energetic or enthusiastic or stupid, or simply worrying relative, friend or policeman comes along.

I do not have to trouble you with memories of these occurrences in other medico-legal areas, where people thought that there was no necessity for any more precise legal definition, and the thing could be left "under the counter", so to speak, relying on the good sense, or inactivity, of all concerned. It may be that the law cannot define when a person is dead, that that must be left, or ought to be left, for the medical practitioner. This is certainly the view that is being taken most recently by the members of a very distinguished conference assembled by the invitation of the United Kingdom Minister for Health and the United Kingdom Secretary for Scotland, but what I think can be done, and what ought to be done, is to consider marking a line after which, whether the doctors say the person is dead or is not dead, responsibility for homicide ceases, just as we have marked that line at the other end of the continuum, in respect of those already in being in the womb of their mothers but not yet making their complete appearance into this world. There have been, this evening, suggestions as to the criteria which could be postulated for the purpose of drawing this "end of homicide responsibility" line. The matter upon which Dr. Galbally seems to have concentrated is one that has attracted a good deal of support—the complete cessation of brain activity for one day, two days, whatever particular period that is picked, recorded or not recorded on electroencephalograph drawings and so on. It is suggested by those who have considered this matter in the United Kingdom that such a ruling embodied in a Statute would be in the best interests of doctors engaged in resuscitative activities, in wanting to know when to turn off the switch, or when to unplug the machine generally, and also, in particular, those doctors who are engaged in organ transplants and who want to know when they can take out nowadays the heart, as well as the kidney, or the liver, or the small bowel. If no move of this kind is made, if the matter is left "under the counter", left to the good sense of individual practitioners and the non-activity of policemen and lawyers, it has been suggested, and suggested quite seriously by a distinguished English academic, that a doctor in the kind of situation which

occurred in England in 1963 might just find himself, whatever the end result is, the defendant in a trial for homicide, and his view was that it might well be a trial for murder. A man was injured in a fight, taken to hospital, and after 14 hours his respiration ceased. He was plugged into a machine to keep his respiration going. His wife was asked whether she had any objection to his kidney being taken out for the purpose of an organ transplant. She was assured that there was no possibility whatsoever of his recovery, and she agreed. He was kept plugged into the machine for 24 hours, and during that period his kidney was taken out and transplanted, and then the machine was unplugged, and there was no spontaneous heart beat, or any other signs of life. I do not want to engage in a lengthy analysis of this situation, but simply to say that if the man was alive when the machine was turned off, when the kidney was taken out, then the doctor's legal position is not a very happy one. If he was not, then it ought to be made very clear, and it is not clear in the eye of the Law at the moment that there is no responsibility at the time the machine is switched on. It is interesting to notice that the man who inflicted the injuries which led the unconscious donor to come into hospital, was not prosecuted for homicide, and was not regarded as having brought about the death of the victim by those who had the responsibility for instituting criminal proceedings, but was simply charged with, and convicted of, a criminal assault. Had he been prosecuted for homicide, murder, or manslaughter, the conduct of the doctors would inevitably have been called into question in determining the central question of whether or not the attacker had killed his victim. In one decision, where a superior English Court has looked at this kind of matter, the situation of a person brought to a hospital suffering injuries intentionally inflicted by an attacker and the recipient of what was regarded as medical mal-treatment, that Court held that the attacker had not killed his victim, that his death for the purposes of the attacker's trial for homicide was to be attributed to the medical practitioners. So, all I end up by saying is, that it is important, I think, for doctors and others, for all of us, that these matters should not be left in uncertainty and under the counter. Some attempt ought to be made to draw what can be accepted by all of us, and by the community at large, as a line which, when reached, carries with it an end to responsibility for homicide. This is not to say, of course, that if such a step is taken, all doctors will turn off the machine, or all doctors

will cease other resuscitative measures or start cutting up the body as a corpse. There will still remain those important individual decisions, but they will be made then in an area where medical ethics and considerations about propriety in dealing with corpses, or cold corpses, are the relevant considerations, and they will not be troubled, as I hope they are presently troubled, by a concern about their responsibility under the Criminal Law.

DR. M. G. WHITESIDE: One thing that none of us can answer or ever will answer relates to what is the cost in dollars of human life. We have this problem at many large hospitals in this country, and all over the world now, of trying to decide what patients will be kept alive for various periods of time by a multitude of techniques. Most commonly it is the one Dr. Galbally mentioned, the technique of dialysis to maintain patients on the artificial kidney for prolonged periods of time, and this can be done for periods of one to two years. This is an enormous drain on the Government budget for Health, and in Britain, and more recently in this city, there has been a lot of argument about the desirability, the cost, and the amount of money available for setting up units to cope with the expected number of patients with chronic renal failure. At a lesser level, we have patients with diseases who are inevitably going to die from those diseases, but we find that by intensive treatment, prolonged periods of hospital treatment, and by the activities of a large number of highly skilled people and the use of expensive drugs, we can prolong life for various times. Sometimes the cost and the effort seems hardly worth it. Sometimes the quality of that life that is maintained for that period of time makes it not worth it and this decision has to be made all along the line, and by a doctor, not by a committee.

JUDGE NORRIS: So far as the question of homicide is concerned, there are two forms of the crime of homicide, murder and manslaughter, and each involves killing. Now it is true that, as I believe it to be the law, the acceleration of death is a sufficient killing for the purposes of the law of homicide, but the only case in which I conceive a medical man might be presented on a charge of murder in circumstances which are envisaged by Dr. Galbally's paper would be a case where he would be presented having removed an organ from a person who was dying for the purpose of an organ transplant. I would think it would be extremely difficult to secure any evidence fit to be left to a jury that he had thereby accelerated the death of the person whose organ

he had removed. I would think that it would be extremely difficult to get from medical men evidence of that kind.

So far as manslaughter is concerned, the only form of manslaughter which I think would be relevant would be that form of involuntary manslaughter which consists in the breach of a duty of care, causing death. Now, the ordinary form of charge to a Jury in this case goes something like this: "Before you may convict the prisoner, you must be satisfied that his want of care was gross, wicked, something of that kind, gentlemen, but whatever adjective you apply to it, it must go beyond that breach of care which affords a matter for compensation between subject and subject, and be so great as to, in your opinion, amount to a crime against the State, and conduct deserving of punishment". Again, I would think that it would be extremely difficult to secure any evidence fit to be submitted to a jury to enable a doctor to be put in peril on a charge of that kind, in view of the evidence that has been given by Dr. Galbally and by other medical witnesses here this evening.

DR. MORRIS C. DAVIS: If we define anything, scientific or otherwise, we have to know what we are defining. In defining death we are defining, and I emphasise defining, a negative state, and I think the complication of death is, in fact, the definition of life, and until we can define what we mean by living, we cannot define death. I would suggest, and I would be sure, or nearly sure, that Dr. Galbally would agree, that the problem of the dead is complicated by the fact that life involves more than a human being. It involves his environment. It involves the need with which his family wants the person. It needs, perhaps his state of poverty. It needs a number of considerations other than within the person, and this seems to be completely overlooked this evening, as to what are the total definitions of life, I would call them, in terms of the end of it. Now, if this be correct, how is it possible to define death, and worse than ever how is it possible to define death with a Committee. I am most intrigued by Professor Waller's comments. I think that they are highly important. I think that if we could, in a sense, define a limit, then homicide would be defined in terms of "you go so far and no further". I point out this tremendous conflicting involuntary factor of which we are all a part. Man is very morticed to his environment, and whether we like it or not, no definition of death can exclude everything that surrounds him. This is a subtle problem, and we are meeting with this problem day in and day out, the physician

who understands humanity, and, I have no doubt, the lawyer and the legal man who, likewise, understands the outside. Where the two meet, let us be careful not to make too many definitions and become too regimented and find we miss all these niceties and complexities of life, and I make the challenge, what about defining life?

MR. K. A. AICKIN, Q.C.: Dr. Shelton has said, "What of the 20,000 intensive care units which do not exist?", and Mr. Justice Smithers has said, "What does a hospital impliedly agree to do for a patient?", a patient, perhaps, who is presented involuntarily to a hospital which feels an obligation to accept him, though, no doubt, in many cases, unwillingly. The problem that has been discussed is I think, primarily neither legal nor medical, but social. If an intensive care unit such as Dr. Galbally manages, controls, or directs, is a rarity in this community, as I gather it is, by what criteria does the institution with such an intensive care unit decide as between two patients which shall be the one for whom the only available capacity of its unit shall be used? This may present a problem to a particular unit. It is obviously the same kind of problem that Dr. Whiteside had in mind as to the priority which should govern the use of the community's resources, but if one reduces it to a small scale and a single unit with a capacity limited by the machines, and the drugs and the skilled technicians, by what criteria is the patient to be chosen? Who is to have the dubious benefit, if one gathers it is, of artificial prolongation of his life? Who is to be chosen for that privilege?

MASTER E. N. BERGERE: One problem that was barely touched on tonight seems to me to be one that may assume a greater significance in the future as medical knowledge enables more efforts to be made to revive or keep alive people who would have been previously regarded as fatally injured, or having but a very short period to live. In this day, it is so frequent that people are injured at the same time, and in the same accident, people who are related to each other and who may be the heirs or inheritors of each other's properties. It seems to me that if you have a case of two people, both suffering serious injuries, naturally the doctor who is asked to provide some treatment for them will endeavour, if he can, to do something for the injured persons. He may have to decide, if there is a possibility of keeping one alive but not the other, it is conceivable that he may have to take into account the fact that in playing God, he has to consider not

only the injured persons, but also their relatives and the people who may inherit from them. If he decides to make an effort to save the life of a critically injured person, and preserves that life for, perhaps, a half hour longer or even a day longer than it may otherwise have been preserved, he may seriously alter the distribution of property that may come about. Now, supposing that those two people are unconscious and barely alive, but they are kept alive by artificial means, or, rather, their blood is kept circulating, their respiration is kept going by artificial means, but it is ultimately decided that there is damage to the brain or some other vital area which does not justify the continuation of keeping them alive, and the measures are stopped, it seems to me that some judge is going to be asked to say when, in fact, did someone die, or which one died first. It seems to me that there are a number of potential problems which make it very urgent that we should consider when a seriously injured person, whose life is preserved, does, in fact, die.

DR. GALBALLY: As to my views about other facilities being provided for the intensive care management of patients, my answer to this, of course, is that I would like to see such facilities provided in many more centres, not only in this city, but around Australia. I believe that the facilities that are provided do justify their existence. They are expensive. They are not only expensive with regard to equipment and the actual facilities that are provided, but they are also expensive with regard to the question of manpower and nurse-power, providing doctors and nurses around the clock for the observation and management of these patients. But mine is only "one voice crying out" for wanting more of a particular thing. There are so many aspects of medicine today where there is just not enough being provided in the way of facilities, even in an affluent society such as our own. It is all very well to say people have reached the end of a reasonable life so we should not go to too much trouble to resuscitate somebody, but it is only if we do pursue very strenuously endeavours to this direction, as well as in so many other directions in medicine, that the facilities will become more easily available and will become cheaper. If these procedures, which are at a certain point inordinately expensive and inconvenient, later become more commonplace and inexpensive, which undoubtedly is the history of so many of them, then I think that we have very good reason to push on, and to ignore the fact that our Government tells us that there just is not the money. This is an affluent

society, but we still cannot go to these lengths. If we were to go to war tomorrow, there would be money found to wage war. It would be found from somewhere. Why can it not be found for these things in peace time?

Professor Waller did mention a particular case in the United Kingdom where a patient was connected up to a respirator and then an organ removed. This is, I think, a rather unusual set of circumstances. I know that, for example, in any situation where I have seen a respirator used for such a purpose, the respirator would actually be disconnected from the patient, and there would be no question of the certification of death. This would happen, irrespective of what the law was requiring at any particular time. One would have to satisfy oneself that the patient was dead, or, at any rate, that your potential donor was, in fact, dead. There would be a time period when the respirator would be disconnected from the donor and death would truly occur. Then, after death had occurred, certainly to restore oxygenated blood to that particular organ a person may be put back on to the respirator after death for a particular purpose, but this interval would occur when the non-interested medical party would be satisfied that the criteria for death actually existed.

There is one other point to which, again, I really do not know the answer, with regard to whether artificial prolongation of life is necessary or not, or whether perhaps we should be thinking more of producing new lives rather than worrying too much about the old ones, but, perhaps, I will stick to the old adage that "The devil you know may be better than the devil you do not know".

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