

Brain Death - An Opposing Viewpoint

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• **Recent and proposed legislation to establish “brain-related” criteria of death has uniformly confounded irreversible cessation of total brain function with the death of the human person. Much of the confusion comes from widespread misunderstanding of how the word “death” is used and what it means. Cessation of total brain function, whether irreversible or not, is not necessarily linked to total destruction of the brain or to the death of the person. Further, to take vital organs or to otherwise treat people as though they were dead already on the basis of these recent criteria is morally unacceptable to most Orthodox Jews and Christians. (JAMA 242:1985-1990, 1979)**

In a 1977 article in THE JOURNAL, Veith et al¹ argued in support of defining death by statute. They favored, in particular, a statute modeled on the American Bar Association's (ABA's) proposed definition of death: “For all legal purposes, a human body with irreversible cessation of total brain function, according to usual and customary standards of medical practice, shall be considered dead.” (Since the arguments we shall offer against the ABA proposal apply a fortiori to statutes based on the Capron-Kass models, we do not discuss these latter explicitly, though Veith et al regard them, along with the ABA's proposal, as satisfactory. For similar reasons, we do not take up explicitly the Uniform Brain Death Act, proposed in August 1978 by the National Conference of Commissioners on Uniform State Laws).

As many others before them have done, Veith et al discuss medical feasibility and write at length concerning legal advantages.¹ What seems to be novel in their article are their arguments that “pronouncements of death on brain-related criteria are in accord with secular philosophy and principles of the three major Western religions.”

The present article is written to show that the ABA's definition of death and, indeed, all 19 or so statutes that have undertaken to define and establish at law “brain-related” criteria of death are based on scientifically invalid assumptions and are also opposed to the three major religious traditions of this country.

Understanding ‘Death’

When speaking of “definitions of death,” a sharp distinction must be made between two quite different modes of definition. On the one hand, “death” is the word we use to

name a certain *empirically given* state of affairs, a state difficult to describe in full generality, yet one with which we are all too familiar as a situation of fact. Someone we have known ceases to breathe, sags wherever not supported; we find no pulse; there is no sign of inner activity of or reaction; all is silent, inert, then cold; the body grows rigid, later becomes flaccid and begins to putrefy, decomposing till only bones remain. Most importantly, from a certain moment on---“the moment of death”—whatever happens, whether it involves putrescence, mummification, incineration, or nuclear vaporization, is entirely describable in terms of disintegration, dissolution, destruction of the unity of the single organism that was formerly present: a human being has, so far as this world can tell, simply ceased to be.

On the other hand, at all times people have attempted, when using the word “death,” not merely to refer to the experientially given state we have mentioned but to say what that state is, to explain it where possible, at least to describe it in terms of the concepts found useful for describing the rest of the universe. Such a re-description and, ultimately, *explanation* of death can be seen as a definition of “death” *within the framework* of that single system or world view. These context-dependent definitions, then, may well be debated and argued by all concerned. None of them are, as such, empirically given; none express solely what are matters of medical fact, though some definitions may elevate certain descriptive elements to the level of system. The shallow approach to so profound a reality as death taken by a number of medical and legal ethicists today who consider death not to be a fact but a matter of mere use of language or convenient social stipulations seems to arise from their confounding the two basic kinds of definition.

Now, at law, the non-empirical, context-related definitions of philosophers and theologians have in the past been carefully avoided, if for no other reason than it is not within the competence of the law to discriminate among them. But death itself, the fact, not the concept, the endlessly repeated and sorrow-laden seeming extinction of human beings, *is* the law’s concern, as it is that of the ordinary people who look to the law for the protection of their lives. No moving away from the *empirical* notion of death can be acceptable as law.

The legal question being debated at present, however, is not about the definition of death, despite the efforts of some to turn it that way, but about the validity of certain proposed *general criteria* for death. For, people have long known that the ultimate disintegration can be foreseen without danger of error at a time well before manifest putrescence. For example, once rigor mortis is observed, we are wholly certain that the person has died. With the progress of medicine, yet other clusters of empirical signs occurring still closer to

the moment of death have been found to be reliable indicators that death has occurred. Such sets of signs as rigor mortis and these more recently validated ones we call "general criteria" of death.

To verify the presence of a general criterion requires, in turn, the use of subordinate or secondary criteria. Many observations and tests may have to be made and many factors considered if full certitude is to be had in difficult cases. But, it is essential to note, neither subordinate nor general criteria *define* "death," none of them are what we mean by "death." They are merely specifications, general or particular, of the sorts of observational data that would enable us validly to conclude to the fact of death in a particular case. Now, most of the "definitions of death" under current discussion, e.g. irreversible cessation of total brain function, turn out to be, on inspection, just such general criteria.

All general criteria used as standard up to now have developed from the intention to make sure that a person who is still alive will not be treated as if dead. The proposed new criteria are intended to be used in the opposite sense: to prevent someone from being treated as alive when he is already dead. One is concerned now to prevent the possibility that present-day life-support systems might mask death and cause a corpse to mimic life--at expense to the living, in suffering and in money. In the past, a mistaken determination of death usually had no other result for a dying patient than his being allowed to die without further treatment. But new criteria are intended not only to decide as soon as possible when someone is dead but, among other options, to clear the way for the excision of his vital organs—action which, if a mistake has been made, is certain to kill the still-living patient. Since any criteria nowadays must subserve organ transplantation as well as other purposes, any new general criterion of death must be at least as certain as the older ones, since a mistake here would be lethal. Yet as we shall soon see, the proposed criteria are far less certain than the older ones; they are, we shall argue, not merely uncertain but certainly wrong in principle.

We point out first that nothing describable as "brain function" is simply equivalent to human life, though, once the brain is formed, human life usually, but not always, requires some kind of perduring function of the brain. We then argue that cessation of function, whether irreversible or not, has no necessary connection with either destruction of the brain or death of the person and, therefore, cannot serve as a general criterion of death. We conclude by showing that so-called definition-of-death legislation goes directly contrary to the major religious traditions of this country.

'Brain Function' or Functions of the Brain?

Before considering the medical aspects of this question, it is important first to dispose of an all-pervasive philosophical sleight-of-hand that forms the hidden and often unconscious root of most arguments we have seen on the subject. It can be summed up in the following line of reasoning.

The brain (or some selected portion of it) is that organ whose specific action it is to make a human person be alive. The brain cannot, therefore, by definition cease this function without making the person cease to live. Hence, cessation of total brain function (not "brain functions," some few of which, apart from this primary one, may continue for some time after death) is, by definition, identical with death of the person. (This line of reasoning has been made explicit by DeMere²⁻⁴ but is implicit throughout of the literature.^{1, 5-7})

Were this argument valid, then any cessation of total brain function would be death, by definition. The recoveries of all those who have shown for many hours, even days, no discernible trace of any brain function as a result of various depressant poisons or of hypothermia would have been resurrections from the dead. And if it be objected that such people not really suffer cessation of total brain function but only seemed to, then we are being offered a criterion that is empirically unable to do the *job* it was introduced to accomplish.

Philosophically, the argument implies, all unnoticed by many of its proponents, a strict materialism. It reduces the life of the human person to a putative organic function of the material brain. "Brain function" is so defined as to take the place of the immaterial principle or "soul" of man. Of course, such a materialism is a widely held philosophical option. But it stands in flat contradiction to the religious beliefs of Christians, Jews, Moslems, Hindus, and many others. Thus, no arguments based on such reasoning can be allowed if religious acceptability is claimed, as it has been by Veith et al.'

But, whatever be the merits of the argument philosophically or theologically, its medical presuppositions are untenable. The brain consists not of a single part but of several closely interrelated ones (cortex, cerebellum, midbrain, medulla, etc.). Though composed of superficially similar tissues and closely linked together both anatomically and physiologically, yet these parts can continue to live and act independently of one another, even when one or more of them has been destroyed.⁸ As one might then expect, the brain as a whole has no physiologically identifiable, single function that could rightly be called the

“life-giving function” or the function of the brain as “organ of the whole.” Rather, there exists a large multiplicity of different functions that are characteristic of the different parts. Although the characteristic functions of the brain-parts normally are closely coordinated, each part can function without the others. Further, none of these parts is in complete control of the others. Thus, the cortex usually controls voluntary motor activity, but reflexly yields control to the midbrain if, for example, one trips while running.

In consequence, each set of secondary medical criteria that have been proposed for ascertaining “brain-death” looks or tests for the absence of the characteristic functions proper to each of the brain parts singly.^{9, 10} If all tests for these functions in the individual brain-parts are negative, the neurologist using these criteria is considered justified in asserting the brain to be dead, at least by that standard. Multiple criteria are required because of the multiplicity of parts and of their functions. No single criterion is ever offered as uniquely testing for this putative function of the entire brain.

The brain is, then, an organ whose varied functions serve to integrate physiologically (eg, by biophysical, biochemical, or other neuronal mechanisms) the different parts of the body. Such physiological operations of integration are, in fact, the ordinary conditions for the continuance of the organismic unity of the body. But if “total brain function” can legitimately mean no more than the sum-total of the characteristic functions of all parts of the brain, then the brain's ceasing to function does not imply, *a priori*, its destruction but only its loss of physiological activity. Admittedly, this is a loss that usually tends, quickly if not instantaneously, to the destruction of the brain and to the disintegration of the body that we call “death.”

Nonequivalence of Destruction and Loss of Function

But, if irreversible loss of “brain function” cannot be a general criterion of death, we still have to consider the question: if there is an irreversible loss of all the characteristic functions of the brain, must we say the brain has died, ie, has been wholly destroyed? (We use “destroy” throughout this article in its primary sense: “to break down or disintegrate the basic structure of,” “to disrupt or obliterate the constitutive and ordered unity of.” Nowhere in this article does “destruction” imply abruptness or physical violence. For the brain, “destruction” implies such damage to the neurons that they disintegrate physically both individually and collectively). The converse, of course, is obvious: the total destruction of the entire brain does imply irreversible cessation of every kind of brain function. Whether total

destruction of the brain is simply equivalent to the death of the person we consider elsewhere (unpublished manuscript).

There are evidently many varieties of reversible cessation of brain-functioning known. Most of these are nondestructive. But we know of no medical principle that requires that a nondestructive cessation of function must always be reversible. There is no evident contradiction in supposing the existence of permanent synaptic barriers, permanent analogs of botulinus toxin or morphine, or yet other mechanisms that would block all brain functioning while leaving the brain's neuronal structure intact and ready for action (at least until such time as the effects of this non-function on the rest of the body might react back on the brain in a destructive manner). Therefore, there is no reason to think that cessation of function, whether reversible or irreversible, necessarily implies total or even partial destruction of the brain; still less, death of the person.

The same distinction, applied to other organs and functions, has been of major importance for the advance of medicine. For centuries, irreversible cessation of breathing was taken as a sure token of death or its immediate presage. Once it was realized that the bronchial tree and lungs need not have been destroyed by that irreversible cessation, the advent of mechanical ventilators was assured. Not many years ago, cessation of heartbeat was taken as equivalent to death. Medically, it was irreversible. Yet physicians came to see that, so long as the heart itself was not destroyed by the arrest, a potentiality for continued function remained and the various means of cardiac resuscitation were developed. Moved by such considerations, Safar et al¹¹⁻¹³ have recently begun successful brain resuscitation in cases where both brain-related criteria and the older, generally accepted ones would have justified a declaration of death. Once again, it is the existence of the organ that is primarily significant, not its functioning.

Thus, the statutes that have sought to turn a loss of brain function into a general criterion of death are all vitiated by a fundamental category mistake: they take *that which functions* to be simply identical with its *functioning*. Yet, if something irreversibly ceases to function, its existence is not necessarily extinguished thereby; it merely becomes permanently idle. Non-function, no matter what qualifiers are used with it, is not the same thing as destruction.

In any case in which all functioning of the brain has irreversibly ceased, destruction of the brain and death will follow fairly quickly unless vigorous therapeutic action is taken.

But if proper supportive action is taken, such an irreversible lack of brain function might well last for a long time before the patient would begin to suffer destruction of brain tissue and die.

In such circumstances, one would certainly not be free to treat a patient as dead. So long as we are dealing solely with cessation of function, we are dealing with a living patient. If, further, he happens to be dying, by this very fact he is not yet dead. Whatever room there may be for discussion, pro and con, concerning obligations to maintain the supportive action that prevents the situation from deteriorating, at least as long as destruction of the brain has not occurred, the patient is alive. As far as we can now know, there would even remain some possibility that a successful therapy might be found.

Irreversibility: A Non-Empirical Confusion

In addition to confounding what functions with its functioning, the proposed criteria introduce further confusion through “irreversibility” and its cognates. Now, irreversibility as such is not an empirical concept and cannot be empirically determined. Both destruction of the brain and the cessation of its functions are, in principle, directly observable; such observations can serve as evidence. Irreversibility, however, of any kind, is a property about which we can learn only by inference from prior experience. It is not an observable condition. Hence, it cannot serve as evidence, nor can it rightly be made part of an empirical criterion of death.

If someone's head has been completely crushed by a truck or vaporized by a nuclear blast, or if his brain has been dissolved by a massive injection of sulfuric acid, then a cessation of function has occurred that we rightly see as absolutely irreversible. But it is the manifest destruction of his brain that convinces us of this total irreversibility, not vice versa. But if there is no proof of complete destruction, then any declaration that a cessation of function is absolutely irreversible is a presumption, even if well grounded, which is contingent on the current state of medical knowledge and on the availability of adequate life-support systems in the concrete circumstances. Even if the presumption is correct, it establishes, as seen above, no necessary link with destruction of the brain. If it is incorrect, the patient may possibly be cured. Thus, whether right or wrong, a presumption as to the irreversibility of a lack of brain function is insufficient ground for removing a patient's vital organs or for immediate autopsy, cremation, or burial.

Overdoses of morphine or of barbiturates, interactions of drugs, hypothermia, cardiovascular shock, and a number of metabolic and other disorders have all, in times past, brought about cessation of all brain function that was, in fact, irreversible. Yet means have gradually been found to reverse, at least occasionally, these previously irreversible types of loss of function. At least the first time each of these conditions was successfully reversed, some patient survived vital organs could have taken on the basis of the proposed brain-related criteria had no reversal been attempted. Further, if irreversible cessation of total brain function were the same thing as destruction of the brain, there would be no purpose to any research designed to discover how to turn any current, medically irreversible cessation of function into a reversible one. Yet such research continues to be remarkably fruitful.¹²⁻¹³

In brief, to regard the irreversibility of cessation of brain function (at best, a deduction from a set of symptoms) as synonymous or interchangeable with destruction of the entire brain (one but not the only possible cause of these symptoms) is to commit a compound fallacy: identifying the symptoms with their cause and assuming a single cause when several are possible.

Certitude and the Protection of the Dying Patient

There are practically important corollaries flowing from all the above. First, the tests or secondary criteria that indicate that the entire brain has been wholly destroyed and those tests that indicate only that it soon will, of necessity, be wholly destroyed need to be carefully distinguished. If the former tests give positive indications (that is, show complete destruction), and if brain death and personal death be taken as identical--a point we do not concede--physicians could be free at once to excise organs for transplant; whereas if the latter tests are positive (that is, show incipient destruction only), physicians must wait for the natural completion of the destructive process rather than do anything that would attack the human life still present.

Further,, following those tests that show incipient destruction only, ie, that the patient is dying but not dead, the length of time one must wait before one can have certitude that the patient has died must have been definitely established.^{9, 14} The difficulty of his problem can be seen, to give but one example, in the matter of the EEG. The length of time between the cerebral insult and the taking of the EEG can considerably modify the diagnostic power of a single 30 minute recording.⁵ And there are cases, albeit rare, in which tracings subsequent to a flat EEG show a return of activity--sometimes only after 24 hours or more.⁵

^{9, 15} More information and detailed analysis can be found in Black's study of the temporal aspects of the tests in current use.¹⁴

A further corollary, based on such evidence as that adduced by Veith et al¹ is that damage resulting in total cessation of function need not be total damage. We take this to indicate that various kinds of merely partial destruction can produce obstacles or “roadblocks” to total function--with, again, a corresponding need to distinguish between malfunction or non-function and death.

Why Not Say ‘Complete Destruction’?

Perhaps the strongest argument against the identification of irreversible cessation of total brain function with total destruction of the entire brain is this: those who propose this legislation do not really accept the identification themselves. Although their arguments for the religious acceptability of such statutes (and most of their legal arguments) hold only if this identification is valid, yet, as soon as the level of practical consequences is reached, their arguments and actions deny this supposed identity.

For, if "irreversible cessation of total brain function" were merely other words for saying "complete destruction of the entire brain," as Veith et al' and many others who continually interchange the two notions must assume, then why would there be the least hesitation on the part of the proponents to drop all reference to “brain function” and to ease their opponents’ fears by substituting “complete destruction of the entire brain?” But, in fact, the proponents have vigorously resisted, efforts to make this replacement.^{2, 16} Yet surely, no function of a brain could survive that brain's complete destruction.

What is of still greater interest is that the proponents resist with equal vigor every effort to replace “total brain function” by “all brain functions” or “each and every function of the brain.” They consider a requirement that all brain functions cease before a person is declared dead as excessive. They wish to allow for some “peripheral” brain functions after the patient's death. Some few cells or tissues of the brain, we are told, might still function with independent lives of their own, no longer related to the rest of the body, much as hair can “grow” on the head of a corpse.^{2, 3, 16} Once again, in other words, “total brain function” is being defined--through the argument discussed in the second section of this article--so that it is made the function of the brain as the “organ of life.” If then, *this* function has ceased, the person is “dead,” even if some secondary functions might continue afterwards.

We may be permitted to wonder what lies behind this resistance to the identification they themselves have so constantly used and without which their basic arguments collapse. If the only brain functions that are to be distinguished from this putative “total brain function” were firings of a few isolated neurons or the like, perhaps all this would not matter much. But since death is to be constituted by the loss of this supposed “brain function,” and this only, there is nothing to prevent *any* of the characteristic functions of the component brain parts from being declared “peripheral.” For it is certain that no one of them can be declared to be that function that alone makes the whole person live. The Minnesota criteria evidently regard cortical activity as peripheral when reticular formation function has ceased,⁹ the British criteria, when the brainstem's functions are gone due to structural damage.¹⁰ Many today argue that midbrain activity or brainstem activity is peripheral once the cortex has ceased to function.^{1, 19} There is no limit to what real functions may be declared peripheral when the only non-peripheral function is imaginary.

Further, if complete destruction of the brain were what really is intended, then why is so much written concerning indefinite ventilation of corpses and the like? If a patient whose whole brain has been destroyed is on a respirator, then, even by the older criteria, with only the rarest of exceptions would he survive more than a week.^{5, 20} If, however, his brain is not dead but merely nonfunctioning because of some CNS depressant, say, then ventilatory support *should* be continued, at least as long as there is any chance of effecting a recovery or even of seeking an as yet unknown way to reverse his presently irreversible lack of function.

Definition of Death Legislation: Religiously Unacceptable

It is now easy to show that all of *varied* types of “definition-of-death” legislation are incompatible with the religious beliefs of most Americans.

Veith et al' are correct when they state, concerning the Orthodox Jewish position: “Thus, *destruction of the entire brain, and only that*, is consonant with biblical pronouncements on what constitutes an acceptable definition of death...” [our emphasis]. This statement shows them to be in error when they go on to say, “This Orthodox Jewish position is not alone among major Western traditions in supporting a of death based on *irreversible loss of brain function*” [our emphasis]. Rather, the Orthodox Jewish position is in flat opposition to, and cannot be reconciled with, the ABA's definition or any other criterion of death based on cessation of function tun on total destruction of the entire brain. (A brief but sharply reasoned and well-documented demonstration of this point is given by Bleich.²¹

Rabbi Tandler's remarks [and the very title of his article] would seem to argue against what we have said here. A careful reading, however, especially of pages 394 through 395, suggests that he is, as are the Catholic theologians we will mention shortly, rather the victim of the almost universal confusion that we have analyzed and clarified in third section of this article).

The same conflict exists between those merely functional criteria and Catholic teaching concerning death, a teaching based not on absence of function but on alteration of being. If recent Catholic moralists have tended to overlook some of the difficulties we have pointed out above, this may be due partly to forgetfulness of the empirical nature of death (for, apologetic considerations have made them emphasize their explanatory definition of death as, eg, separation of soul and body), and partly to their tendency to work more directly from the experience of those posing the questions, in this case physicians, than from the general content of Catholic faith. Thus, they have accepted, more easily than their Jewish counterparts, physicians' occasionally somewhat careless juxtaposition, if not actual confusion, of irreversible loss of brain-functioning and the destruction of the brain. (Consider, for example, the practice of some Catholic physicians who see themselves justified, by the principles governing cessation of treatment, in ceasing their efforts to defer death, but who fear legal difficulties if they do so. They resort, in consequence, to a kind of legal fiction, declaring the patient, whom they know to be only dying, to be dead before turning off the respirator. Such a fiction need do the patient no wrong under the circumstances; but it *has* done harm by leading those who do not recognize the fiction involved to confound the dying patient with a dead one and to consider death to have occurred even in patients showing clear signs of life).

The presentation of Connery's earlier position by Veith et al, though a bit confused, is correct. But Connery has indicated to us, in letters and in conversation, that he is far from satisfied on this matter and has a number of pertinent reservations. McFadden's principles are sound enough.²³ Thus he remarks: "Obviously the process of embalming (and the performance of an autopsy) may not be commended until it is certain that life is extinct...mere probability, even very great probability that death has already taken place will not justify the beginning of the process."

He has, however, accepted without apparent questioning the omnipresent identification of cessation of function with destruction, as he shows on page 201, where he is thinking of dying brain cells but talks at once of loss of function as wholly equivalent. When Haring

speaks for himself,²⁴ it is always in terms of destruction (the lack of physical substrate for activity, etc.) although he accepts the Harvard criteria without questioning their shift to cessation of function.

Therefore, it is at least premature to say that the Catholic Church, or even her theologians of the present day, finds the position favoring determination of death on the basis of “irreversible cessation of brain function” acceptable. If our arguments are correct, Catholics must be as strongly opposed to this as are Orthodox Jews.

This is confirmed by the remarks of Pope Pius XII in the same document quoted by Veith et al:¹

In case of insoluble doubt, one can resort to presumptions of law and of fact. In general, it will be necessary to presume that life remains, because there is involved here a fundamental right received from the Creator and it is necessary to prove with certainty that it has been lost [authors' emphasis].

Further on, he says:

But considerations of a general nature allow us to believe that human life continues for as long as its vital functions--distinguished from the simple life of organs--manifest themselves spontaneously or even with the help of artificial processes.²⁵

He is asserting that vital functions indicate the presence of life, even when artificially maintained; he does not say that their absence is adequate proof of death.

Protestant theologians differ too widely in their views to speak with any common voice. Yet we think, judging from the nature of their responses to abortion, infanticide, and euthanasia, that many of them (along with many, if not most, of their religious confreres), on consideration of the issues raised in this article, would also be opposed to this legislation on much the same grounds as Jews and Catholics.

The implications of all the above for medical practice, as well as for legislation concerning death, are developed elsewhere (unpublished manuscript). Here, suffice it to remark that we would do better to work at repeal of current legislation on the subject than at extending it further.

Fr Louis Barth, SJ, Rabbi Simcha Krauss, Fr Albert S. Moraczewski, OP, Fr. Linus Thro, SJ, and Edward W. Warner, LLB, provided advice and encouragement. Joseph M. Dooley, Jr.,

MD, Fr Edwin L. Lisson, SJ, Gaetano Molinari, MD, Harvey B. Sarnat, MD, and Robert M. Woolsey, MD, read and criticized a preliminary version of our text. Rabbi J. David Bleich, Fr John Connery, SJ, and McCarthy DeMere, MD, LLB, sent informational material. Peter Safer, MD, and Malcolm Orr, MD, provided details of their experience.

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