DEATH: A PHILOSOPHICAL PERSPECTIVE ON THE LEGAL DEFINITIONS

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Language cannot be made precise enough to eliminate dispute about every possible application of a given term. Unforeseen circumstances may reveal vagueness in any term. Furthermore, the human needs and interests directing creation of the distinctions fixed by language are not static. Consequently, categorial adjustments and definitional changes are often required.

Developments in medical technology, most notably in organ transplantation and artificial life-support, have provoked a reconsideration of the time-honored legal definition of death. Traditionally defined as the total and permanent arrest of all vital functions, including cardiac and respiratory functions,[1] the term "death" has proved to be unacceptably vague. For example, a distinction can now be made between spontaneous and artificially maintained life functions. Furthermore, the practice of pronouncing death only in the event of both cardiac and respiratory failure has proved inhibiting and burdensome to the procurement of useful organs for transplantation; transplant surgeons operating in jurisdictions that have not adopted appropriate legal definitional adjustments risk civil suit if they select donors whose cardiac function has not totally failed.[2]

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1. *See, e.g.*, Thomas v. Anderson, 96 Cal. App. 2d 371, 215 P.2d 478 (1950) (affirming the trial court's determination of which of two persons died first). In *Thomas*, the appellate court stated: " 'death is the cessation of life; the ceasing to exist; defined by physicians as a total stoppage of the circulation of the blood, and a cessation of the animal and vital functions consequent thereon, such as respiration, pulsation, etc.' " *Id.* at 376, 215 P.2d at 481-82, *quoting* BLACK'S LAW DICTIONARY 488 (3d ed. 1933). *See also* Smith v. Smith, 229 Ark. 579, 587, 317 S.W.2d 275, 279 (1958); *In re* Estate of Schmidt, 261 Cal. App. 2d 262, 273, 67 Cal. Rptr. 847, 854 (1968); Schmitt v. Pierce, 344 S.W.2d 120, 133 (Mo. 1961) (use of the traditional definition of death set forth in BLACK'S LAW DICTIONARY).

For a compilation of various formulations of the traditional notion of death used by the courts, see Halley & Harvey, *Medical vs Legal Definitions of Death*, 204 J.A.M.A. 423, 424 (1968).

2. For example, in Tucker's Adm'r v. Lower, No. 2831 (Richmond, Va., Ct. L. & Eq., May 25, 1972), a wrongful death action was brought against a heart transplant

Unfortunately, the effort to meet these semantical and practical difficulties in defining death through legislation[3] and judicial decision[4] might well prove to be short-sighted. The new brain death definitions of human death can impose needless economic and emotional burdens on families, physicians, and hospitals that care for permanently and irreversibly comatose bodies. Because certain lower brain centers that support respiration have not ceased to function, such persons are not dead under either the traditional or the new total brain death definition of death.[5]

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surgeon by the donor's brother. The jury found for the surgeon after the judge instructed that it had the option of using complete and irreversible loss of all brain functions as one of several tests for determining the time of death. For details and analysis of the trial, see Converse, *But When Did He Die?:* Tucker v. Lower *and the Brain Death Concept*, 12 SAN DIEGO L. REV. 424 (1975); Mosher, *When Does Life End?*, The National Observer, June 3, 1972, at 1, col. 1; N.Y. Times, May 24, 1972, at 6, col. 1; *id.*, May 27, 1972, at 15, col. 5.

3. *See* ALASKA STAT. § 09.65.120 (Supp. 1975); CALIF. HEALTH & SAFETY CODE §§ 7180, 7181 (Deering 1975); KAN. STAT. ANN. § 77-202 (Supp. 1975); MD. ANN. CODE art. 43, § 54F (Supp. 1975); Mich. Pub. Acts of 1975, No. 158 (July 23, 1975); N.M. STAT. ANN. § 1-2-2.2 (Supp. 1975); OKLA. STAT. ANN. 63 § 1-301(g) (Supp. 1975); VA. CODE ANN. § 32-364.3:1 (Supp. 1975); W. VA. CODE ANN. § 16-19-1(b) (Supp. 1975).

4. In People v. Saldona, 121 Cal. Rptr. 243 (Ct. App. 1975), People v. Lyons, No. 56072 (Oakland, Cal., Crim. Super. Ct., May 23, 1974), and State v. Brown, 8 Ore. App. 72, 491 P.2d 1193 (1971), homicide cases, brain death was adopted as a definition or criterion of human death. In New York City Health & Hosp. Corp. v. Sulsona, 81 Misc. 2d 1002, 367 N.Y.S.2d 686 (Sup. Ct. 1975), petitioner sought a declaratory judgment on the meaning of "death" in New York's Uniform Anatomical Gifts Statute, N.Y. PUB. HEALTH LAW §§ 4300 et seq., 4301, 4306 (McKinney 1971). The court held that the statute, in accordance with accepted medical standards, equated brain death with human death. *See also* Tucker's Adm'r v. Lower, No. 2831 (Richmond, Va., Ct. L. & Eq., May 25, 1972) (complete and irreversible loss of all brain functions one option in determining time of a wrongful death).

5. Much discussion surrounded the case of Karen Ann Quinlan, the twenty-one year old victim of brain damage who was described by her neurologist, Dr. Robert J. Morse, as in a "chronic vegetative state." Public attention was focused on the new "brain death" definition of death which requires not only irreversible loss of all consciousness but also the cessation of those vegetative functions supported by brain stem activity. In his prayer to the court, Joseph T. Quinlan requested that his daughter, Karen Ann Quinlan, be declared mentally incompetent and that he be granted letters of guardianship with the express power to authorize the discontinuance of all extraordinary means of sustaining his daughter's vital processes. It was recognized that Karen was not dead under either the traditional or "brain death" definitions. Even if it could have been shown that Karen was irreversibly incapable of any consciousness, she retained some degree of spontaneous respiration. Because respiration is supported by the functioning of the brain stem, she could not have been totally brain dead. *In re* Quinlan, 137 N.J. Super. 227, 348 A.2d 801 (Super. Ct. 1975), *rev'd*, 44 U.S.L.W. 2463 (N.J. Sup. Ct. Mar. 31, 1976). For a compilation of the legal briefs, court proceedings and

Age-old confusions about the logical status of definitions and the proper method of resolving disputes about them have plagued much of the discussion and many of the decisions relating to the definition of death. This Commentary attempts to shed some light on the logic appropriate to arguments and decisions concerning definitions, and especially the definition of death. It raises criticisms of the most recent and most significant definitional proposals, enactments, and rulings. Finally, the Commentary proposes for consideration a definition of death that avoids the shortcomings of previous proposals.

The best definition of human death would not express a *truth* or be a true statement about the nature of death: no definition proposed or adopted can be defended on the ground that it is true, nor criticized on the ground that it is false with respect to what death itself is. Nonetheless, the search for an acceptable, if not a true, definition of death should not be abandoned. The medical profession, however, in advance of legislation reflecting public opinion, should not be permitted to employ new criteria of death that indicate the occurrence of phenomena not covered by the traditional notion.

A publicly defensible definition can be developed if it is recognized that any definition proposed or adopted, whether it reasserts, precises, or radically alters the traditional notion of death or the new brain death definitions, is an expression of *choice*. Although it has no truth-value, the choice is defensible in relation to the semantic and ethical problems that initiated its consideration and the other human interests and needs affected by its legal adoption.

In light of semantic and ethical requirements developed from a consideration of the problems and interests surrounding the definitional debate, the Commentary evaluates the various definitions of death recently set forth by state legislatures, courts, and professional organizations, all of which equate human death with a physiological state of one kind or another. In turn, a definition of human death on a *psychological* plane that identifies death with the permanent loss of all consciousness is recommended for public acceptance. Accordingly, certain physiological states, such as the functional disintegration of the brain (or of the brain cortex alone), become empirically established indicators (diagnostic criteria) of the occurrence of human death in the psychological sense.

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decision in the *Quinlan* case, see IN THE MATTER OF KAREN QUINLAN (1975) (University Publications of America, Inc.).

I. DEFINITION IN GENERAL

Surrounding the current dispute about how death should be defined legally is a more general disagreement about the nature of the task at hand and the logic appropriate to the argument. The proper order of philosophical inquiry requires preliminarily a clarification of the type of definition sought and the mode of argument proper for its defense.

According to one view, a definition must express a truth of some sort; hence, any definition must be accepted as a knowledge-claim. This approach to definitional dispute has very ancient roots; Socrates' search for definitions was presented in Plato's dialogues as a search for true statements. When Socrates rejected the definitional proposals of his interlocutors, it was frequently on the ground that they were false.[6] Aristotle also thought that in defining one should attempt to give a correct account of the nature of the thing in question: a proper definition formulates the essence or nature of a thing.[7] Several participants in the current debate on the definition of death have adopted comparable views. For example, Hans Jonas argues that there is a dividing line between life and death which human fiat can neither fix nor change.[8] Unfortunately, the precise location of that line is presently unknown; with the advent of recent medical technology, determining the status of certain patients may be impossible. Nonetheless, he argues, our attempt to define death is still subject to the demands of truth: a definition of death should not unwittingly include what may in truth be part of the domain of life. Thus, nothing less than the maximum definition of death will do—brain death plus heart death plus any other indication that may be pertinent.[9] Sheff Olinger, arguing for a "cerebral death" definition that would require only the irreversible loss of function of that part of the brain necessary for awareness and consciousness, claims that his definition is "true."[10] Leon Kass asks whether determination of a definition of death is a "matter of the true, or a matter of the useful or good?" Without deciding the issue, Kass

6. The most dramatic illustration of Socrates' search for true definitions is found in the following dialogues of Plato: *Euthyphro*; *Laches*; *Lysis*; *Symposium*; and *Republic.*

7. An extended discussion of definition and essence is to be found in Aristotle's *Metaphysics*, Book 7.

8. *See* Jonas, *Philosophical Reflections on Experimentation with Human Subjects*, 98 DAEDALUS 219, 244 (1969).

9. *Id.*

10. Olinger, *Medical Death*, 27 BAYLOR L. REV. 22 (1975) [hereinafter cited as Olinger].

criticizes any quick dismissal of the view that "death" need not express a truth.[11]

Defining death should not be an attempt to formulate a true statement of what death actually is; unresolvable controversy would arise if the task were perceived as a search for the truth about death. Yet a definition that is to be used for all legal purposes must be publicly defensible. Necessarily, a definition should be viewed as a *convention* of language, and a proposed definition of death as a preference about the way the term should be used in legal contexts. It then becomes possible to develop arguments that any rational person can accept in support of one definition rather than another.

Perhaps this concept is best explained by an illustration. Assume that an individual in response to a call for a definition of death, declares that death is really permanent coma. Assume also that this person intends by his declaration to express a necessary truth about the world and not a mere tautology reflecting some convention of language. It is not clear what public defense, if any, could be offered to meet a challenge of his knowledge-claim.

First, appeals to insights into the essence of things have never resolved—and would not here resolve—anything; opponents can always claim their own insights without fear of refutation. Furthermore, the existence or reality of essences remains problematic after more than 2000 years of debate. Second, an appeal to empirical findings would provide no support. Empirical findings would establish only the occurrence (or nonoccurrence) of death in particular cases and other logically non-necessary facts such as the conditions under which it occurs, and its effects. Further, before the empirical order can be used to support a claim about death, a decision must have been reached about what is to be meant by "death." As William James stated: "Experience merely as such doesn't come ticketed and labelled."[12] Empirical information is developed in terms of the categories and distinctions that individuals bring to their experiences. Finally, no appeal to purely a priori reasoning would convincingly establish the truth of the claim. The hypothetical claimant does not intend to advance a claim whose truth is a deductive consequence of the meanings of the terms alone; in that case, the claim would be true, independent of the nature of the world.

11. Kass, *Death as an Event: A Commentary on Robert Morison*, 173 SCIENCE 698, 700-01 (1971) [hereinafter cited as Kass].

12. W. JAMES, PRAGMATISM 172 (1907).

In short, the claimant is without any recognized means of defending his claim to a rational public.

If the definitional problem created by the new medical technology is viewed as a matter of truth, an unfortunate consequence is likely to occur: either the adoption of a perniciously dogmatic stand about the truth of the definition or the adoption of various tests and criteria of death without a definition of the underlying state they allegedly indicate.

The attempt to establish empirical tests and criteria for an undefined state is deceptive: either a definition is actually, but covertly, operative or the tests and criteria are totally arbitrary and in need of a determined definition to set their limits.

These dangers can be averted and a publicly defensible definition can be determined if a conventionalist viewpoint is substituted for the position that an acceptable definition is a knowledge-claim. From the conventionalist perspective, any definition, beyond a mere lexicographic report about the use of the term by certain people at certain places and times, is treated as the expression of a choice concerning a future linguistic convention; it is not treated as a statement asserting what in truth death itself is. Accordingly, various categorial distinctions are treated as linguistically fixed human inventions and not as eternal essences or naturally fixed kinds that the human mind can discover but not create.[13]

The choice of a convention about the term "death" is, of course, not arbitrary; its public defensibility relates to the problems that provoked its consideration and the other human needs and interests that would be affected by its legal adoption. Furthermore, once the definition of the term "death" is adopted and the borderline between life and death is chosen, the classification of particular cases becomes a purely factual issue.

In stipulating meanings for legal terms such as "death," one confronts demands unlike those confronting theoreticians such as pure mathematicians, who must also establish meanings for the technical terms employed. Of course, both cases require that vicious multivocity[14] as well

13. *Cf.* J. LOCKE, ESSAY CONCERNING HUMAN UNDERSTANDING, bk. 3, ch. 3, ¶ 11-14 (5th rev. ed. 1706). Locke argued that the kinds, divisions, essences, and sorts of things that men recognize are but "inventions" of the human mind; they are as men, and not nature, make them. Choice is involved. That different people make different choices is evident from disagreements over the boundaries of the various kinds of things they distinguish.

14. "Multivocity" is a philosophical term signifying the situation when one term has

as unnecessary vagueness be avoided. The pure mathematician, however, need not concern himself with the effects on human life and social relationships resulting from wedding a certain meaning to a term that already determines the conditions under which certain rights and duties are protected and exacted. By contrast, enacting a legal definition of the term "death" determines whether a given individual will continue to receive specific immunities and protections and whether other individuals will be obligated or liable in certain ways. As a consequence, defining "death" is an *ethical choice* and, as such, is subject to additional demands.

The legal definition of the term "death" affects social arrangements when death is pronounced and certified. Pronouncing and certifying that someone is dead are unique kinds of legal performances, quite different from the ordinary acts of merely describing or recounting the fact that someone has died. More than being true or false statements of an actual occurrence, the death pronouncement and certification as legal acts are rightly or wrongly performed. Such factors as who made the pronouncement and signed the certificate and in what manner and under what circumstances these acts were performed are made relevant by law. Properly performed, pronouncement and certification of death trigger legal mechanisms that alter rights, duties, and responsibilities in matters of ownership, transplantation, autopsy, burial, and even criminal and civil liability. The legally recognized definition of the term "death" determines the range of application of these mechanisms of law. Because of the connection between the semantics of the term "death" and the effect of the properly performed pronouncement and certification of death, the task of stipulating a definition of the term "death" for legal purposes has an ethical force.[15]

Since, in its ethical dimension, defining death requires reaching pervasive policy decisions, the public should be involved in determining the definition. Contrary to the opinion of some authorities,[16] it is not the prerogative of the medical profession to decide the matter. First, this nonfactual question cannot be settled by empirical inquiry; hence, medical science, an empirical discipline concerned with the prediction, expla-

more than one meaning. A multivocity is "vicious" when it results in systematic confusion in practical affairs.

15. *Cf.* C. STEVENSON, ETHICS AND LANGUAGE 294-97 (1944).

16. *See, e.g.*, Kennedy, *The Kansas Statute on Death—An Appraisal*, 285 NEW ENG. J. MEDICINE 946 (1971).

nation, and control of certain matters of fact, lacks the appropriate competence. Furthermore, in a democratic and pluralistic society, basic social arrangements and public ethics should not be determined by one segment of the populace. For the same reason, the legal community should not think of itself as the sole arbiter of the question. Both the legal and medical professions have the right and the responsibility to advance, as several voices among many, their recommendations concerning the definition. Expeditious settlement of the problem is vital for the sake of physicians who must know the extent of potential criminal and civil liability and who are responsible for patient care, and for the sake of incapacitated individuals themselves.

The medical profession must be relied upon to determine reliable empirical tests for the type of incapacity eventually identified by law as death. Appropriately, an Ad Hoc Committee of the Harvard Medical School has recommended specific empirical indicators of irreversible loss of brain function, which is one possible definition of death.[17] In

17. Ad Hoc Committee of the Harvard Medical School to Examine the Definition of Brain Death, *A Definition of Irreversible Coma,* 205 J.A.M.A. 337 (1968) [hereinafter cited as Harvard Committee].

As noted in the Harvard Committee report, the absence of circulation manifested by the stoppage of blood in the retinal vessels or by the absence of cardiac activity, for even a relatively brief period of time, is a safe sign of total brain death in patients not subjected to artificial life-support measures. Anoxia causes total and permanent brain damage in a few minutes. The patient maintained on a mechanical respirator presents further problems; the brain may be permanently nonfunctional while the heart may continue to beat. The Harvard Committee points out four signs of total brain death when a mechanical respirator has been employed:

> 1. *Unreceptivity and Unresponsitivity* [*sic*].—There is total unawareness to externally applied stimuli and inner need and complete unresponsiveness—our definition of irreversible coma. . . .
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> 2. *No Movements or Breathing.*—Observations covering a period of at least one hour by physicians is [*sic*] adequate to satisfy the criteria of no spontaneous muscular movements or spontaneous respiration or response to stimuli such as pain, touch, sound, or light. After the patient is on a mechanical respirator, the total absence of spontaneous breathing may be established by turning off the respirator for three minutes and observing whether there is any effort on the part of the subject to breathe spontaneously. . . .
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> 3. *No Reflexes.*—Irreversible coma with abolition of central nervous system activity is evidenced in part by absence of elicitable reflexes. The pupil will be fixed and dilated and will not respond to a direct source of bright light. . . .
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> 4. *Flat Electroencephalogram.*—Of great confirmatory value is the flat or isoelectric EEG. . . . At least ten full minutes of recording are desirable, but twice that would be better.

Id. at 337-38.

Together the first three signs are sufficient for diagnosis. The fourth sign provides "confirmatory" data that should be used when available, but it is not by itself sufficient

addition, since medical professionals are recognized as expert witnesses in the courts, they must continue to settle questions about the fact and time of the occurrence of death in particular cases, using the criteria recognized by the profession. Criteria to be used in diagnosing the occurrence of a state cannot honestly be established in advance of some definition of that state. Thus, in advance of a legal redefinition of death, the medical profession's use of criteria that determine the occurrence of even a slightly different state than that covered by the traditional definition would either involve a covert redefinition of death or be absolutely arbitrary.

If the public is to participate in the defining of death, then it seems clear from arguments similar to those advanced by Alexander Capron and Leon Kass[18] that each state legislature should be engaged in formulating a statutory definition of death. As Capron and Kass pointed out, the encouragement of public discussion and the establishment of study commissions to consult public views and issue resolutions, though helpful, are not alone adequate to establish policy. Reliance on the judicial system is also not appropriate, for the courts are not equipped to hear and heed public views. Without authority or machinery to hold public hearings or survey public opinions, courts rely on medical professionals as expert witnesses in matters involving death. Moreover, the courts act not independently but only in response to matters brought to their attention through litigation. On the other hand, the legislative branch has the authority and machinery to involve the public in decision making and to issue standards that reflect the will of the public.

II. Requirements for an Adequate Definition of Death

As has been argued, the definition sought has no truth-value. Nonetheless, it must meet a number of requirements derived from semantic problems of vagueness and ambiguity and from practical and ethical problems connected with determining certain basic rights and duties. To be acceptable a definition of death must meet the following requirements.

A. *Designation of a Publicly Verifiable State*

The definition must designate some status that can be determined

or necessary. All of the signs must be evidenced with no change in 24 hours after being established.

18. Capron & Kass, *A Statutory Definition of Standards for Determining Human Death: An Appraisal and a Proposal*, 121 U. Pa. L. Rev. 87, 95-101 (1972).

publicly and with a high degree of certainty. Because the irreversibility or permanence of a condition is not directly observable, the use of that element must be connected with some other phenomenon that is itself directly and publicly observable and that is a reliable indicator from which pertinent inferences can be drawn about the occurrence of death.

To be a reliable indicator or criterion of death, a phenomenon must have been shown to have a regular and invariable connection with the occurrence of death. A single failure of an accepted criterion should provoke reexamination. For example, the complete recovery of a boy maintained by a respirator over a two-week period after displaying a "flat" EEG (isoelectric electroencephalogram), loss of reflexes and responsiveness to environment, fall in arterial blood pressure, and loss of spontaneous respiration should raise serious questions about the adequacy of these phenomena as indicators of death.[19] The demand for reliability might require that a criterion of death be composed of a set of factors; for instance, a complex of neurological and behavioral indicators might be used. New findings and technological developments should lead to refinements in accepted criteria and to the addition of other criteria. Thus, statutes should not enumerate the criteria of death; only the definition should be so determined. Once the legislature establishes a definition, the medical profession can determine empirically the directly observable phenomena that are reliable indicators of the occurrence of death as defined.

To be directly and publicly determinable, any criterion of death must be a *physical* manifestation such as the absence of heartbeat, respiration, reflexes and other muscular movements, or an isoelectric EEG. On the other hand, the definition itself might well designate the loss of a *psychological* capacity, as, for example, the permanent loss of the capacity for consciousness. A definition indicating the permanent loss of a psychological capacity would be acceptable insofar as it related in a regular way to certain physical states observable by a physician.

Because many of the definitions of death embodied in religious doctrines and the systems of metaphysical philosophers do not signify a publicly verifiable condition, they could not be reasserted as a legal definition of death. For example, death as the separation of soul and body, a definition found in many religious doctrines and in Platonic philosophies, is inadequate. The occurrence of death in this sense

19. *See* Wecht & Aranson, *Medical-Legal Ramifications of Human Tissue Transplantation*, 18 DE PAUL L. REV. 488, 491 (1969).

cannot be confirmed, for there is no public evidence of the existence of a soul to be so separated.

B. *Avoidance of Vagueness*

To be adequate, a stipulation must avoid indeterminacy of application in particular cases when there is knowledge of all pertinent facts of the case. It would be impractical, however, to require that a stipulation guard against vagueness in every imaginable situation; not only would the definition be complicated with details for situations having little likelihood of occurring, the definition would also be all but impossible to formulate since the range of such situations is indefinite. As new and unforeseeable circumstances emerge, the task of remedying any newly revealed vagueness with additional precision will have to be continued. Novelties capable of upsetting customary nomenclatures can never be precluded.

C. *Avoidance of a Vicious Multivocity*

In the effort to correct the vagueness of the traditional definition of death, a "vicious multivocity" must not be introduced. If the device of legislating "alternative definitions" were employed, one of which reasserted the traditional sense of the term, and the other of which indicated the kinds of cases that had been in a grey area (such as permanently comatose patients maintained on artificial support systems), the system would have to include safeguards against arbitrariness and confusion about which definition would be employed in which sorts of cases. If some case could warrant a death pronouncement by one definition and not by the other, confusion would result; if one patient were pronounced dead in accordance with one definition and another patient in the same condition and in the same jurisdiction were declared to be alive by the other, inequity would result.[20] Although the multivocity involved in "alternative definitions" is not necessarily vicious, a single definition establishing a single meaning certainly has the advantage of simplicity.

D. *Designation of a State Whose Onset Is Instantaneous*

Because determination of death has effects on inheritance and rights of survivorship, death must be defined as a state whose onset is instanta-

20. For criticisms of the "alternative definitions" of death enacted in Kansas, see text accompanying notes 24-28.

neous and temporally fixed. In this respect, the stipulation will be continuous with the traditional use of the term.

The debate whether death is a process occurring over a period of time or an instantaneous event is confused.[21] Death, in the traditional sense, is neither a process nor an event, but a *state*. More specifically, the term "death" traditionally designates the state of having permanently lost the capacity to exercise certain functions. Those who argue that death connotes an instantaneous event might be confusing the state itself with its onset, its coming into being, which is instantaneous. The onset of death is necessarily instantaneous because the state indicated by the term "death" has no degrees, and between it and its opposite there is no middle position. In contrast, for instance, there is a middle between poverty and wealth; consequently, through a gradual process, an individual can become more wealthy or less poor. In relation to life and death as they are traditionally understood, however, a person has either irreversibly lost the relevant capacities and is, therefore, dead, or he has not. If anything is gradual, it is the process called "dying," which is part of life, not death. A biologist might point out that *total* death of an organism, including death of all organs, tissues, and cells, need not occur simultaneously. He would reflect more accurately the traditional sense of the term "death" if he spoke of a series of instantaneous occurrences rather than a continuous process; the serial occurrences are the commencements of states of irreversible loss of capacity in various systems, subsystems, and units composing the organism.

E. *Designation of an Irreversible State*

The definition should indicate some state of lost capacity only insofar as it is irreversible by ordinary medical procedures. Unimaginable confusion about legal rights, such as inheritance and rights of survivorship, would be introduced by creating semantically a category of persons who, having overcome some state of incapacity, could be said to have been dead temporarily. Nor does it make literal sense to say that a resuscitated person was dead temporarily.[22]

21. *See* Kass, *supra* note 11; Morison, *Death: Process or Event?*, 173 SCIENCE 694 (1971).

22. Serious thought has already been given to the legal implications of "cryogenic interment," the freezing of patients who have been declared dead, and of the revival of those patients at some date in the distant future. *See* Gorney, *The New Biology and the Future of Man*, 15 U.C.L.A. L. REV. 273, 323-25 (1968); Henderson & Ettinger, *Cryonic Suspension and the Law*, 15 U.C.L.A. L. REV. 414 (1968).

Such remote possibilities of revival must be excluded from the general notion of irre-

F. *Acceptability to the Public*

Because it is an act that determines the persons to whom certain basic human protections are extended and rights granted, stipulating a legal definition of the term "death" must meet the *ethical* requirement of a pluralistic and democratic society. The rule of action must be one that all or most persons are willing to have applied to themselves. If citizens are to participate, as they should, each citizen should ask himself the following questions: Under which kind of permanent incapacity am I willing to have removed from me (i) the rights and protections guaranteed to me as a living person and (ii) the duties and responsibilities imposed upon me for those in my care? Am I willing to have these removed only if irreversible loss of all vital functions is sustained? Or am I willing to have these removed if irreversible loss of consciousness is suffered even though heart action continues spontaneously? Other questions of this kind may follow.

In making a choice of the kind of incapacity to be defined as death, there is no reason that the facilitation of organ transplantation, for example, should not be one of many factors considered. Death should be defined in such a way that its pronouncement establishes legal rights and duties that are consistent with the preference of all or most citizens, each one of whom will eventually have the law applied to himself. Once the informed preference of the public is determined and an appropriate definition of death is adopted, however, no practical consideration, such as the facilitation of transplantation, should be considered in determining the empirical *criteria* for diagnosing the occurrence of the incapacity defined as death. Establishing criteria is a factual process requiring scientific inquiry into the empirically sufficient conditions for the occurrence of death in the sense previously defined; the criteria cannot be established in advance of the definition.

III. CRITIQUE AND PROPOSAL

The outstanding proposals, decisions, and statutes concerning the redefinition of death can be conveniently divided into six kinds: (a) the "alternative definitions" approach which reasserts, with some precision, the traditional definition and adds a second that recognizes permanent loss of brain function as death; (b) the "refined criteria"

versibility that should be embodied in current laws defining death; the irreversibility of functional incapacity should relate only to current medical capabilities.

approach wherein, in lieu of a definition, new tests and methods are set forth for determining the status of the cases falling in the uncertain area between life and death as traditionally understood; (c) the "single total brain death" definition by which a patient can be pronounced dead if and only if irreversible loss of all brain function is sustained; (d) the "open-ended brain death" approach which legalizes brain death as one definition or criterion of death without excluding other definitions or criteria that are and may come to be accepted; (e) the "cortical death" (or "cerebral death") definition which involves extending the boundary of death to include any patient who has sustained permanent loss of the functioning of the brain cortex or cerebrum; and (f) the "psychological death" definition which identifies death with the permanent loss of consciousness by the human organism. The merits of these approaches must be analyzed in light of semantic and ethical requirements.

(a) In 1970 the Kansas legislature adopted the "alternative definitions" approach to defining death:

> A person will be considered medically and legally dead if, in the opinion of a physician, based on ordinary standards of medical practice there is the absence of spontaneous respiratory and cardiac function and, because of the disease or condition which caused, directly or indirectly, these functions to cease, or because of the passage of time since these functions ceased, attempts at resuscitation are considered hopeless; and, in this event, death will have occurred at the time these functions ceased; or
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> A person will be considered medically and legally dead if, in the opinion of a physician, based on ordinary standards of medical practice, there is the absence of spontaneous brain function; and if based on ordinary standards of medical practice, during reasonable attempts to either maintain or restore spontaneous circulatory or respiratory function in the absence of the aforesaid brain function, it appears that further attempts at resuscitation or supportive maintenance will not succeed, death will have occurred at the time when these conditions first coincide. Death is to be pronounced before artificial means of supporting respiratory and circulatory function are terminated and before any vital organ is removed for purposes of transplantation.
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> These alternative definitions of death are to be utilized for all purposes in this state, including trials of civil and criminal cases, any laws to the contrary notwithstanding.[23]

23. KAN. STAT. ANN. § 77-202 (Supp. 1975).

The Kansas statute, and the Maryland,[24] New Mexico,[25] and Virginia[26] statutes later modeled upon it, have a number of virtues. They

24. The 1972 Maryland statute defining death is modeled on the Kansas statute, differing only in that the words "in the opinion of a physician" in the first sentence of the first paragraph of the Kansas statute have been eliminated; the words "and because of a known disease or condition" have been added to the first sentence of the second paragraph immediately after the words "based on ordinary standards of medical practice." MD. ANN. CODE art. 43, § 54F (Supp. 1975).

25. The 1973 New Mexico statute is quite similar to the Kansas and Maryland statutes, adding only that the law defining death does not affect the law of presumptive decedents in that state. In full, the New Mexico statute is as follows:

> A. For all medical, legal and statutory purposes, death of a human being occurs when, and "death," "dead body," and "dead person" or any other reference to human death means that:
>
> (1) based on ordinary standards of medical practice, there is the absence of spontaneous respiratory and cardiac function and, because of the disease or condition which caused, directly or indirectly, these functions to cease, or because of the passage of time since these functions ceased, there is no reasonable possibility of restoring respiratory or cardiac functions; in this event death occurs at the time respiratory or cardiac functions ceased; or
>
> (2) in the opinion of a physician, based on ordinary standards of medical practice: (a) because of a known disease or condition there is the absence of spontaneous brain function; and (b) after reasonable attempts to either maintain or restore spontaneous circulatory or respiratory functions in the absence of spontaneous brain function, it appears that further attempts at resuscitation and supportive maintenance have no reasonable possibility of restoring spontaneous brain function; in this event death will have occurred at the time when the absence of spontaneous brain function first occurred. Death is to be pronounced pursuant to this paragraph before artificial means of supporting respiratory or circulatory functions are terminated and before any vital organ is removed for purposes of transplantation in compliance with the Uniform Anatomical Gift Act.
>
> B. The alternative definitions of death in Paragraphs (1) and (2) of subsection A of this section are to be utilized for all purposes in this state, including but not limited to civil and criminal actions, notwithstanding any other law to the contrary.

N.M. STAT. ANN. 1-2-2.2 (Supp. 1975).

26. The 1973 Virginia statute defining death, clearly modeled on the Kansas statute, includes several innovations. It makes clear, as the Kansas, Maryland, and New Mexico statutes do not, that for death to have occurred in accordance with the brain death definition, spontaneous respiration must also have ceased. The statute also requires that a consulting physician who is a specialist in neurology, neurosurgery, or electroencephalography make the determination of brain death. By specifying the physician who must make the determination, the Virginia statute not only establishes the definition of death but also affects the criteria of death.

According to the Virginia statute:

> A person shall be medically and legally dead if, (a) in the opinion of a physician duly authorized to practice medicine in this State, based on ordinary standards of medical practice, there is the absence of spontaneous respiratory and spontaneous cardiac functions and, because of the disease or condition which directly or indirectly caused these functions to cease, or because of the passage of time since these functions ceased, attempts at resuscitation would not, in the opinion of such physician, be successful in restoring spontaneous

define death in terms of conditions that are readily discoverable by medical professionals, if not by the layman. Additionally, because the statutes do not force the medical profession to use particular criteria, developments in diagnostic methods are not hampered. The statutes also avoid some of the vagueness of the traditional definition of death. Accordingly, the statutes specify that absence of "spontaneous" function is pertinent in determining whether death has occurred; the traditional definition is ambiguous when applied to patients whose vital functions are maintained artificially. Furthermore, under the statutes a physician may determine that resuscitation efforts are "hopeless" or "will not succeed" or are lacking a "reasonable possibility" of success (that is, that the cessation of function is irreversible) based upon "ordinary standards of medical practice." This refinement is important because what is hopeless or irreversible with respect to certain remedial measures need not be so with respect to others.

All of the "alternative definitions" statutes, however, make "death" a multivocal term. Taken literally, the statutes have several rather bizarre implications that their makers certainly could not have intended. For example, the first of the "alternative definitions" provides that a person will be considered dead if spontaneous respiratory and spontaneous cardiac functions are absent and if attempts at resuscitation are deemed hopeless. The second provides that a person will be considered dead if spontaneous brain function is absent and if it appears that attempts at resuscitation or supportive maintenance will not succeed. The statutes do not specify that the first definition applies only if no artificial support

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life-sustaining functions, and, in such event, death shall be deemed to have occurred at the time these functions ceased; or (b) in the opinion of a consulting physician, who shall be duly licensed and a specialist in the field of neurology, neurosurgery, or electroencephlography [*sic*], when based on the ordinary standards of medical practice, there is the absence of spontaneous brain functions and spontaneous respiratory functions and, in the opinion of the attending physician and such consulting physician, based on the ordinary standards of medical practice and considering the absence of the aforesaid spontaneous brain functions and spontaneous respiratory functions and the patient's medical record, further attempts at resuscitation or continued supportive maintenance would not be successful in restoring such spontaneous functions, and, in such event, death shall be deemed to have occurred at the time when these conditions first coincide. Death, as defined in subsection (b) hereof, shall be pronounced by the attending physician and recorded in the patient's medical record and attested by the aforesaid consulting physician.

Notwithstanding any statutory or common law to the contrary, either of these alternative definitions of death may be utilized for all purposes in the Commonwealth, including the trial of civil and criminal cases.

VA. CODE § 32-364.3:1 (Supp. 1975).

of respiratory and cardiac function is employed and that otherwise the second definition applies. Thus, the statutes could be interpreted to mean that a patient who suffers irreversible loss of spontaneous respiratory and spontaneous cardiac function, but who remains conscious because of the use of the appropriate artificial support, is dead by the first definition. The same patient by the second definition is not dead, however, as long as those portions of the brain serving consciousness continue to function.

An analogous implication of the Kansas statute was noted by I.M. Kennedy. "[Patient] X at a certain stage in the process of dying can be pronounced dead, whereas [patient] Y, having arrived at the same point, is not said to be dead."[27] By the second definition patient X is dead if the specified brain damage is sustained *even though* his heartbeat continues spontaneously. By the first definition, however, patient Y is not dead *just because* his heartbeat continues spontaneously. As Kennedy complains, "[i]t is in no way inspiring of confidence in one's doctor to learn that there are two types of death."[28] Clearly, the problems arising from the multivocity of the Kansas statute should prevent other states from adopting similar statutes.

(b) Efforts have been made to bypass the issue of the definition or redefinition of death and to develop "refined criteria." Under new empirical tests, physicians could diagnose the occurrence of death in difficult cases involving the use of artificial means of life-support. Alexander Capron and Leon Kass, claiming to have deferred consideration of the basic concept of death, proposed model legislation that provided two "*general physiological standards*" for recognizing the occurrence of death: "irreversible cessation of spontaneous respiratory and circulatory function" and, "[i]n the event that artificial means of support preclude a determination that these functions have ceased, . . . irreversible cessation of spontaneous brain functions."[29] The Task Force on Death and Dying of the Institute of Society, Ethics, and the Life Sciences[30] and the American Medical Association (AMA)[31] also

27. Kennedy, *supra* note 16, at 948.

28. *Id.* at 947.

29. Capron & Kass, *supra* note 18, at 111.

30. Task Force on Death and Dying of the Institute of Society, Ethics, and the Life Sciences, *Refinements in Criteria for the Determination of Death: An Appraisal*, 221 J.A.M.A. 48, 49 (1972) [hereinafter cited as Task Force].

31. American Medical Association, Proceedings of the House of Delegates: Clinical Convention, Anaheim, Calif., Dec. 2-5, 1973, at 136 [hereinafter cited as AMA Proceedings: Clinical 1973].

believe that the current controversy about death can be resolved satisfactorily at the level of criteria without affecting the level of definition. Both groups recognize cessation of brain function as one of several acceptable criteria of death.[32]

In 1975, Michigan, drawing on the language of the model statute of Capron and Kass, enacted legislation providing two "means of determining death:"[33]

> (1) A person will be considered dead if in the announced opinion of a physician, based on ordinary standards of medical practice in the community, there is the irreversible cessation of spontaneous respiratory and circulatory functions. If artificial means of support preclude a determination that these functions have ceased, a person will be considered dead if in the announced opinion of a physician, based on ordinary standards of medical practice in the community, there is the irreversible cessation of spontaneous brain functions. Death will have occurred at the time when the relevant functions ceased.
>
> (2) Death is to be pronounced before artificial means of supporting respiratory and circulatory functions are terminated.
>
> (3) The means of determining death in subsection (1) shall be used for all purposes in this state, including the trials of civil and criminals cases.[34]

Much of the language of the Capron and Kass model statute also appears in legislation enacted earlier in West Virginia[35] and Alaska.[36] In

32. Task Force 49-51; American Medical Association, Proceedings of the House of Delegates: Clinical Convention, Portland, Ore., Dec. 1-4, 1974, at 303.

33. Act No. 158, Mich. Pub. Acts of 1975 (July 23, 1975).

34. *Id.* Subsection (1) of the Michigan statute is very similar to the model statute developed by Alexander Capron and Leo Kass. Capron & Kass, *supra* note 18, at 111. Subsection (1) differs only in that the words "in the community" have been added in the first and second sentences following the words "ordinary standards of medical practice;" the words "there is the" replace the words "he has experienced an" in both the first and second sentences; and the word "If" replaces the words "In the event that" at the beginning of the second sentence.

35. W. VA. CODE ANN. § 16-19-1(b) (Supp. 1975) provides:

> "Death" means that a person will be considered dead if in the announced opinion of the attending physician, based on ordinary standards of medical practice, the patient has experienced an irreversible cessation of spontaneous respiratory and circulatory functions; or, in the event that artificial means of support preclude a determination that these functions have ceased, a person will be considered dead if in the announced opinion of a physician, based on ordinary standards of medical practice, the patient has experienced an irreversible cessation of spontaneous brain functions.
>
> Death will have occurred at the time when the relevant functions ceased.

Id.

36. ALASKA STAT. § 09.65.120 (Supp. 1975) provides:

both of these states, however, the statutes were intended to determine the definition and not merely the various criteria of death.

Capron and Kass propose legislation that would determine nothing more than the general physiological standards for diagnosing the occurrence of death because they consider the "basic concept of death" a "philosophical matter," about which "differences of opinion would seem to be hard to resolve, and agreement, if it were possible, would provide little guidance for practice."[37] In contrast, they believe that standards, criteria, and tests are "medico-technical" matters and as such are amenable, presumably, to definite determination.[38] If Capron and Kass are correct in thinking that current problems concerning death can be treated satisfactorily as simply criterional and, thus, medico-technical problems, then statutory changes are neither desirable nor necessary, as both the Task Force on Death and Dying[39] and the AMA[40] point out. Treating the problem as a criterional, rather than a definitional, issue, however, raises several questions.

First, the definition of the "basic concept" of death *can* be settled in a way that is both decisive and publicly defensible, as long as it is perceived as a matter of *choice*—a choice that the public can make in light of preferred arrangements of rights, duties, and protections.

Second, the question of the definition of the basic concept of death cannot be avoided. The general physiological standards or criteria first identified by Capron and Kass, and followed by the Michigan statute, the Task Force on Death and Dying, and the AMA are *extensionally equivalent* to a *single* definition of death in terms of irreversible loss of brain functions. That is to say, those cases and only those cases numbered among the dead by the "brain death" definition would also

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DEFINITION OF DEATH. A person is considered medically and legally dead if, in the opinion of a medical doctor licensed or exempt from licensing under AS 08.64, based on ordinary standards of medical practice, there is no spontaneous respiratory or cardiac function and there is no expectation of recovery of spontaneous respiratory or cardiac function or, in the case when respiratory and cardiac functions are maintained by artificial means, a person is considered medically and legally dead, if, in the opinion of a medical doctor licensed or exempt from licensing under AS 08.64, based on ordinary standards of medical practice, there is no spontaneous brain function. Death may be pronounced in this circumstance before artificial means of maintaining respiratory and cardiac function are terminated.

37. Capron & Kass, *supra* note 18, at 102-03.

38. *Id.*

39. Task Force 51.

40. AMA Proceedings: Clinical 1973, 136.

be numbered among the dead under the general physiological standards suggested by Capron and Kass. As Capron and Kass themselves point out, the

> two standards . . . measur[e] different manifestations of the same phenomenon. If cardiac and pulmonary functions have ceased, brain functions have ceased, brain functions cannot continue; if there is no brain activity and respiration has to be maintained artificially, the same state (i.e., death) exists.[41]

Thus, at least implicitly, a definition of death in terms of brain death underlies this attempt to develop criteria of death.

Third, the use of brain death as a criterion and, in effect, an implicit definition of death involves a *change* from traditional notions. Death in the traditional sense necessarily involves cessation of spontaneous heartbeat; cardiac arrest is not required under the brain death formulation, however, since cardiac function is somewhat independent of central nervous activity.[42] The Task Force, among others, maintains that using irreversible loss of brain function as a criterion of death is consistent with the traditional understanding of death; it argues that the heartbeat of a brain-damaged patient on a mechanical respirator is an "artifact" and not a spontaneous function because circulation and respiration are intimately connected.[43] The dependence of one thing on another for the long term sustentation of its function, however, does not imply that the function is not spontaneous. The otherwise normal respiration of a patient with a cardiac pacemaker, for example, does not cease to be a spontaneous life function just because it would terminate were the pacemaker removed.

If the definition of death is to become the irreversible cessation of brain function, the change should be accomplished explicitly through an appropriate statute. Once this were done, the medical profession could use as a criterion of death any phenomenon it discovered to be an empirically sufficient condition of death as so defined. By adopting a new criterion of death in advance of an appropriate change in the law, however, the medical profession would assume a right it should not have.

(c) The straightforward identification of human death with "total brain death" was supported by the American Bar Association (ABA) in

41. Capron & Kass, *supra* note 18, at 112.
42. Harvard Committee, 340.
43. *See, e.g.*, Task Force 50.

a resolution passed by its House of Delegates in 1975:

> Be It Resolved, that the American Bar Association adopts a current definition of death as follows:
>
> "For all legal purposes, a human body with irreversible cessation of total brain function, according to the usual and customary standards of medical practice, shall be considered dead."[44]

If taken as a proposal for a *single* definition of death, and not as a supplement to the traditional definition, this resolution identifies death with a single sort of occurrence.

Oklahoma in 1975 enacted legislation that stipulates a single definition of death. The Oklahoma statute provides that "[t]he term 'dead body' means a human body in which there is irreversible total cessation of brain function."[45] By cessation of "total brain function" and "total cessation of brain function," the ABA and the Oklahoma statute refer to permanent loss of brain stem activity, which supports respiration, as well as higher brain activity, which supports consciousness. This single definition approach avoids the ambiguity of the "alternative definitions" enacted in Kansas as well as the confusion about the "two types of death." At the same time, the single "brain death" definition includes among the dead, brain-dead patients on mechanical respirators whose hearts continue to beat, in addition to patients not on mechanical life-support systems who are dead according to the traditional rule of cardiopulmonary arrest; the oxygen-deprived brains of these former patients would also be dead.

The condition identified as death in the ABA resolution and the Oklahoma statute presents no peculiar problems of empirical verification in cases likely to be encountered in the foreseeable future. Unless artificial means of supporting cardiac or respiratory function have been employed, short term cessation of heartbeat or respiration is a reliable indicator or criterion of brain death. If oxygenated blood ceases to flow to the brain, profound and irreversible damage to the brain occurs within several minutes, and death, as here discussed, occurs. On the other hand, when artificial life-support systems are used, the occurrence of death in this sense can be determined by using the test for brain death set forth in the 1968 report of the Harvard Committee.[46]

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44. 61 A.B.A.J. 463, 464 (1975) (report on the recommendations of the House of Delegates).

45. OKLA. STAT. ANN. § 1-301(g) (Supp. 1975).

46. *See* note 17 *supra.*

In every important way, the single definition of death as the permanent loss of total brain function is superior to the "alternative definitions" enacted in Kansas and the "refined criteria" of death recommended by Capron and Kass and others, enacted in Michigan. Precise, unambiguous, and straightforward from the definitional viewpoint, the single definition covers the same cases intended to be included under the Kansas "alternative definitions" and the Michigan alternative "means" or criteria. Thus, if the public would choose this incapacity as the basis for a pronouncement of death, state legislatures should adopt the single "total brain death" definition of human death.

The public, however, must be informed that such a definition of death places a determining emphasis on brain stem activity and, hence, also on spontaneous respiratory function. Thus, according to a "total brain death" rule, a patient who is permanently comatose as a result of brain damage could be pronounced dead *only if* damage is so extensive that permanent cessation of spontaneous respiration is also sustained. On the other hand, another permanently comatose patient who requires artificial respiratory assistance would be considered dead, *even though* heartbeat continues spontaneously.[47]

If the public felt that rights and protections should be afforded in accord with a person's capacity for consciousness (the capacity to be aware of events in the world or within himself), a definition of death that ultimately emphasizes the capacity for consciousness should be adopted. Loss of brain stem activity and the respiration it supports should not play a determining role as they do when "total brain death" defines human death.

(d) Instead of adopting statutes that put restrictions on which definitions or criteria must be employed in pronouncing death, the California

47. J.B. Brierley and his medical colleagues report two cases of permanently comatose patients who resumed spontaneous respiration after cardiac arrest and remained in that state for five months before pulmonary collapse. Brierley, Adams, Graham & Simpson, *Neocortical Death After Cardiac Arrest*, 2 LANCET 560 (1971) [hereinafter cited as Brierley].

Uneasy with the position that respiration must cease before death can be said to occur, Brierley and his colleagues raised the following point:

> Once neocortical death has been unequivocally established and the possibility of any recovery of consciousness and intellectual activity thereby excluded, the question must be asked, although [a] patient breathes spontaneously, is he or she alive?

Id. at 565.

legislature has simply legalized "brain death" as one criterion or definition of human death. The legislature in no way prohibited the use of other accepted criteria or definitions, nor did it close the door to developments in medical technology and in public interest. Death of the cortex of the brain or irreversible loss of all consciousness, for example, might be accepted in the future as proper criteria or definitions of death. According to the California statute:

> A person shall be pronounced dead if it is determined by a physician that the person has suffered a total and irreversible cessation of brain function. There shall be independent confirmation of the death by another physician.
>
> Nothing in this chapter shall prohibit a physician from using other usual and customary procedures for determining such death as the exclusive basis for pronouncing a person dead.[48]

The wisdom of this "open-ended" approach to the issue of the definition of death is obvious, particularly in light of proposals for "cortical death" and "psychological death" definitions.

(e) Recent and developing interest in a "cortical death" (or "cerebral death") definition of human death is motivated by a desire to reevaluate the cessation of spontaneous respiratory function and spontaneous cardiac function as necessary features of human death.[49] The cortical death definition would make the permanent loss of consciousness the basic constituent of human death.

The physiological integrity of the cerebral cortex has been established as an empirically necessary condition for consciousness.[50] Thus, a "cortical death" definition of human death would require permanent loss of consciousness in anyone pronounced dead. Cortical destruction, or destruction of the entire cerebrum of which the cortex is a part, would not, however, necessarily result in loss of spontaneous respiration, a function of lower brain stem activity.

If by public consensus living persons should be distinguished from the dead based upon their capacity for consciousness, "cortical death" or

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48. CALIF. HEALTH & SAFETY CODE § 7180 (Deering 1975).

49. *See, e.g.*, Brierley 265; Fletcher, *New Definitions of Death*, 2 PRISM, Jan. 1974, at 36; Olinger, *supra* note 10, at 22; Rizzo & Yonder, *Definition and Criteria of Clinical Death*, 40 LINACRE Q. 223, 230 (1973); *Death of a Human Being*, 2 LANCET 590 (1971) (editorial).

50. *See, e.g.*, J. ECCLES, THE NEUROPHYSIOLOGICAL BASIS OF MIND 260-67 (1953).

"cerebral death" should be treated merely as a criterion of human death; human death itself should be defined in purely psychological terms, such as the irreversible loss of the capacity for any sort of consciousness. First, the psychological phenomenon of consciousness is not conceptually identical with any neurophysiological occurrence, although an invariant, empirical connection exists between the occurrence of consciousness and the occurrence of neurological events in the cerebrum and its cortex. Even though consciousness occurs only when neural activity takes place in the cerebrum, descriptions of consciousness itself are not conceptually equivalent to descriptions of neural activity in the cerebrum; introspective psychological reports do not describe the brain.[51] Thus, a "cortical death" or "cerebral death" definition differs from a definitional identification of death with the permanent loss of consciousness. Second, the integrity of the cerebrum and the cortex appears to be but one of several empirically necessary conditions of consciousness. Research suggests that interference with certain regions of the brain stem also invariably causes loss of consciousness.[52] Thus, death should not be defined in terms of cortical or cerebral damage alone if every permanently comatose patient is to be considered dead.

(f) Under a "psychological definition" of death the permanent loss of consciousness alone constitutes the death of a human. The following model statute is proposed for consideration by the public:

> For all legal purposes, a person will be considered dead if in the announced opinion of a physician, according to the usual and customary standards of medical practice, there is the irreversible loss of all consciousness. Death will have commenced at the time the loss became irreversible.
>
> This definition of death is to be used for all purposes in the state, including the trials of civil and criminal cases.

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51. Philosophers have interpreted the invariant connection between consciousness and certain neurological events in the brain, vis-à-vis their conceptual difference, as (1) numerically distinct events that are somehow causally connected to each other; (2) numerically distinct events that occur synchronously without being causally connected, reasoning that a causal connection of events so radically different in kind is unintelligible; and (3) distinct and irreducible aspects of what is, in fact, one event. For an analysis and evaluation of the three interpretations of the empirically discovered connection of these psychological and physiological events, see Charron, *The Simplicity of Conscious Experiences: A Problem for Neural Identity Theory*, 51 THE MODERN SCHOOLMAN 335 (1974).

52. *See, e.g.*, W. PENFIELD, THE EXCITABLE CORTEX IN CONSCIOUS MAN (1958).

This recommended definition of death in terms of irreversible loss of consciousness must not be confused with that of the Harvard Committee's 1968 report, *A Definition of Irreversible Coma*, and its "primary purpose [of defining] irreversible coma as a new criterion for death."[53] Rather than recommending that permanent loss of consciousness *by itself* be the criterion, or definition, of death, the Harvard Committee suggested that the permanent loss of *all* brain function, brain stem activity and higher brain function alike, be recognized as the criterion of death.[54] Thus, for the Harvard Committee, permanent coma in the sense of permanent loss of consciousness, alone insufficient to support a finding of death, is but one "sign" or "characteristic" of the occurrence of total brain death. The 1968 report is important technically for its discussion of the specific clinical signs or characteristics by which the physician can diagnose "brain death," the permanent loss of total brain function.[55]

Reliable criteria for diagnosing the occurrence of death in the psychological sense have already, in effect, been discovered. Because the physiological integrity of various parts of the brain is empirically necessary for consciousness, all phenomena that indicate total brain death also indicate a fortiori irreversible loss of consciousness. Thus, without artificial maintenance of cardiac and respiratory function, arrest of heartbeat and respiration indicate death in the proposed psychological sense; permanent and profound brain damage will result when the required oxygenated blood ceases to flow to the brain. If artificial means of life-support are used, the Harvard Committee's tests for "brain death" can be employed to confirm the permanent loss of consciousness constituting "psychological death." Medical science would then have to develop reliable tests for diagnosing the irreversible disintegration of the specific brain parts upon which the human organism's capacity for consciousness depends.[56]

53. Harvard Committee, *supra* note 17, at 337.

54. *Id.* at 337-38.

55. *See* note 17 *supra.*

56. J.B. Brierley and his colleagues claim that

> [i]n the specific context of cardiac arrest, . . . the existence of irreversible neocortical destruction can be established [with the use of the electroencephalograph] within a few days of the arrest provided that drugs with a central depressive effect are not being given. If any element of doubt should then remain, neocortical death could be confirmed by the appropriate neuropathological examination of a biopsy specimen (a 1-1.5 cm. cube) taken from the posterior half of the cerebral hemisphere.

Brierley 565. *But see* Silverman, Masland, Saunders & Schwab, *EEG and Cerebral Death: The Neurologist's View*, 27 ELECTROENCEPH. CLIN. NEUROPHYSIOL. 549 (1969).

The identification of death with permanent loss of consciousness remedies the vagueness of the traditional concept when applied to permanently comatose patients maintained on artificial life-support systems; it identifies a single state as human death and, thus avoids the vicious ambiguity of the Kansas "alternative definitions" approach.[57] Additionally, it identifies death as a permanent state with an instantaneous, ascertainable onset.

Only if the "psychological death" definition meets with public approval, however, can an alteration of the traditional definition be ethically defensible. A Missouri public opinion survey indicates that the public, with its present state of information and reflection on the subject, is hesitant to reject the traditional definition of death which requires loss of all vital functions.[58] The majority of those who do favor a move away from the traditional definition have preferences that accord with the proposed "psychological definition" of death rather than with the "total brain death" definition, or criterion, under consideration in the Missouri legislature.[59] Thus, the majority of those who would redefine death do not consider spontaneous respiration a decisive factor in determining whether someone is alive. Rather, they stress permanent loss of consciousness.

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57. KAN. STAT. ANN. § 77-202 (Supp. 1975).

58. Research and Information, Inc., Missouri Public Opinion Report 60, Sept. 1975; Research and Information, Inc., Missouri Public Opinion Report 65, Nov. 1975.

In state-wide opinion surveys conducted in September and November 1975, Research and Information, Inc., included, at the author's request, a question concerning the attitudes of Missouri residents toward changes in the definition of death. With the permission of the firm, the results of these surveys have been reprinted. *See* Appendix, *infra.*

It is well to note that the survey of November 1975 was conducted after the saturation news coverage of the case of Karen Ann Quinlan, *see* note 5 *supra,* which increased public awareness of many of the complexities in defining death, as well as the issues in the question of the "right to die." A comparison of the November 1975 survey with the earlier survey conducted in September 1975 shows a marked movement toward the acceptance of the permanent loss of all consciousness as constituting human death.

59. At the time this Commentary went to press, two bills were pending in the Missouri legislature: S. 670, 78th Gen. Assemb., 2d Reg. Sess. (1976); H. 1083, 78th Gen. Assemb., 2d Reg. Sess. (1976). The former is a verbatim restatement of the Capron and Kass model statute determining the criteria or "means for determining death." *See* note 29 *supra* and accompanying text. The latter, entitled "An Act to Define Death for Legal Purposes," proposes that "[f]or all legal purposes a human body with irreversible cessation of total brain functions according to usual and customary standards of medical practice shall be considered dead." The Senate shelved S. 670 and authorized the President Pro Tem to appoint a Senate Select Committee on the Definition of Death to study the problem.

IV. CONCLUSION

In this interdisciplinary debate on one of the great social issues of our time, state legislatures and courts rush to institute "(total) brain death" as a restrictive definition or criterion of death for those not dead according to the traditional definition. What should be sought through all the debate is the informed preference of the public who, ethically, should be the dominant influence in determining an issue of choice.

APPENDIX

The Missouri Public Opinion Report is published by Research and Information, Inc., St. Louis, Missouri. It is a series of public opinion issue studies of samples of about 500 randomly selected Missouri residents each quarter. The September 1975 survey was conducted September 13-28; the November survey was conducted November 15-December 1. The sample contained proportionate representation of the ten United States Congressional Districts in Missouri as follows:

District	Percentage
1	8%
2	11%
3	8%
4	11%
5	8%
6	10%
7	10%
8	13%
9	12%
10	9%

In both surveys the following question was asked: Traditionally, a person has been considered dead only when both the heart and lungs have ceased to function. Organ transplants and the use of artificial respirators have raised questions about when a person is to be considered dead. In your opinion, when should a person be considered dead: When the person has permanently lost all consciousness as a result of brain damage, even though the heart and lungs continue to function? When the person has permanently lost both consciousness and lung function, even though the heart continues to beat? Or, only when the heart, lungs, and consciousness have all permanently stopped?

MISSOURI PUBLIC OPINION REPORT, SEPTEMBER 1975

	(N)	Permanently lost consciousness %	Lost consciousness and lung function %	Lost consciousness, lung and heart function %
All respondents	(471)	21.7	7.0	71.3
Urban	(229)	22.7	9.2	68.1
Rural	(242)	20.7	5.0	74.4
Male	(235)	21.7	9.4	68.9
Female	(236)	21.6	4.7	73.7
White Collar	(119)	34.5	9.2	56.3
Blue Collar	(69)	21.7	8.7	69.6

Farm	(22)	4.5	4.5	90.9
Service	(46)	15.2	4.3	80.4
Housewife	(104)	22.1	3.8	74.0
Non-occupational	(111)	13.5	8.1	78.4
Non-high school graduate	(146)	12.3	8.2	79.5
High school graduate	(155)	20.6	5.8	73.5
To two years college	(77)	27.3	3.9	68.8
Two years on/college degree	(69)	34.8	8.7	56.5
Advanced degree	(22)	31.8	13.6	54.5
Under $5,000	(85)	10.6	11.8	77.6
Over $5,000 to $7,000	(61)	19.7	1.6	78.7
Over $7,000 to $10,000	(80)	18.8	5.0	76.3
Over $10,000 to $17,000	(141)	25.5	7.8	66.7
Over $17,000	(86)	30.2	8.1	61.6
18-30 years old	(127)	26.8	3.1	70.1
31-45 years old	(148)	23.6	10.8	65.5
46-62 years old	(108)	22.2	3.7	74.1
63 years old and older	(87)	9.2	10.3	80.5
Voted last major election	(314)	24.5	7.3	68.2
Did not vote last major election	(156)	16.0	6.4	77.6
Republican	(95)	23.2	7.4	69.5
Democrat	(210)	19.0	6.2	74.8
Independent or other	(162)	24.7	8.0	67.3

MISSOURI PUBLIC OPINION REPORT, NOVEMBER 1975

	(N)	Permanently lost consciousness %	Lost consciousness and lung functions %	Lost consciousness, lung and heart function %
All respondents	(455)	37.8	5.0	57.1
Urban	(223)	40.4	6.6	53.0
Rural	(232)	35.7	4.0	60.3
Male	(223)	40.7	4.9	54.7
Female	(231)	35.0	5.2	59.9
White Collar	(115)	36.6	13.8	49.6
Blue Collar	(89)	43.3	3.3	52.8
Farm	(31)	29.0	12.9	58.0
Service	(49)	38.8	8.1	53.0
Housewife	(84)	32.1	2.4	65.4
Non-occupational	(87)	28.7	5.8	65.5

Non-high school graduate	(105)	34.2	2.8	62.8
High school graduate	(184)	41.2	3.2	55.3
To two years college	(80)	32.5	9.9	57.4
Two years on/college degree	(67)	37.3	7.4	55.2
Advanced degree	(19)	47.3	5.2	47.3
Under $5,000	(74)	29.7	5.3	64.9
Over $5,000 to $7,000	(54)	20.3	3.6	75.8
Over $7,000 to $10,000	(83)	42.1	7.2	50.6
Over $10,000 to $17,000	(148)	41.9	2.7	55.4
Over $17,000	(87)	45.9	8.0	45.9
18-30 years old	(136)	41.9	8.7	49.2
31-45 years old	(137)	43.7	2.2	54.0
46-62 years old	(104)	25.9	3.8	70.2
63 years old and over	(77)	35.0	5.1	59.7
Voted last major election	(284)	39.4	3.8	56.6
Did not vote last major election	(169)	34.8	7.0	58.0
Republican	(108)	33.3	5.5	61.1
Democrat	(214)	34.5	4.2	61.2
Independent or other	(130)	46.1	6.1	47.7

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