A STATUTORY DEFINITION OF THE STANDARDS FOR DETERMINING HUMAN DEATH: AN APPRAISAL AND A PROPOSAL*

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In recent years, there has been much discussion of the need to refine and update the criteria for determining that a human being has died.¹ In light of medicine's increasing ability to maintain certain signs of life artificially² and to make good use of organs from newly dead

*This Article grew out of discussions held by the Research Group (formerly Task Force) on Death and Dying of the Institute of Society, Ethics and the Life Sciences, a nonprofit organization engaged in interdisciplinary analysis of the issues generated by biomedical advances. The Research Group has been investigating various practical and philosophical problems in the "meaning" of death and the care of dying patients. Earlier drafts of the Article were discussed at meetings of the Research Group, and, although not the subject of formal approval by the group, the Article reflects the conclusions of the Research Group's members, who include Henry K. Beecher, M.D., Harvard University; Eric Cassell, M.D., Cornell University Medical College; Daniel Callahan, Ph.D., Institute of Society, Ethics and the Life Sciences; Renée C. Fox, Ph.D., University of Pennsylvania; Michael Horowitz, LL.B., New York, N.Y.; Hans Jonas, Ph.D., New School for Social Research; Irving Ladimer, S.J.D., American Arbitration Association; Marc Lappé, Ph.D., Institute of Society, Ethics and the Life Sciences; Robert Jay Lifton, M.D., Yale University; William F. May, Ph.D., Indiana University; Robert S. Morison, M.D., Cornell University; Paul Ramsey, Ph.D., Princeton University; Elisabeth Kübler-Ross, M.D., Chicago, Ill.; Alfred Sadler, M.D., Yale University; Blair Sadler, J.D., Yale University; Jane Schick, Ph.D., M.D., Cornell University Medical College; Robert Stevenson, Ph.D., Bionetics, Inc., Frederick, Md.; Robert Veatch, Ph.D., Institute of Society, Ethics and the Life Sciences. The work of the Research Group has been supported in part by a grant from the New York Foundation. The authors thank the members of the Research Group for their valuable suggestions and critical review of the manuscript and Sharmon Sollito, B.A., Institute of Society, Ethics and the Life Sciences, for her assistance in research.

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¹ See, e.g., P. RAMSEY, THE PATIENT AS PERSON 59-112 (1970); Louisell, *Transplantation: Existing Legal Constraints*, in ETHICS IN MEDICAL PROGRESS: WITH SPECIAL REFERENCE TO TRANSPLANTATION 91-92 (G. Wolstenholme & M. O'Connor eds. 1966) [hereinafter cited as MEDICAL PROGRESS]; Discussion of Murray, *Organ Transplantation: The Practical Possibilities*, in *id.* 68 (comments of Dr. G. E. Schreiner), 71 (comments of Dr. M. F. A. Woodruff); Wasmuth & Stewart, *Medical and Legal Aspects of Human Organ Transplantation*, 14 CLEV.-MAR. L. REV. 442 (1965); Beecher, *Ethical Problems Created by the Hopelessly Unconscious Patient*, 278 NEW ENG. J. MED. 1425 (1968); Wasmuth, *The Concept of Death*, 30 OHIO ST. L.J. 32 (1969); Note, *The Need for a Redefinition of "Death"*, 45 CHI.-KENT L. REV. 202 (1969).

² A dramatic increase over the past twenty years in the use of extraordinary means of support such as artificial respirators for terminal patients is generally assumed by physicians, on the basis of observational and anecdotal evidence, but no quantitative studies of this phenomenon have been done. Telephone interview with Dr. Claude L'Enfant, Director, Division of Lung Diseases, National Heart and Lung Institute, Bethesda, Md., Oct. 16, 1972. For this reason it is not possible to offer any detailed estimate of the impact that the proposed statute, see text accompanying note 86 *infra*, would have on the resources allocated to patient care.

bodies, new criteria of death have been proposed by medical authorities.³ Several states have enacted or are considering legislation to establish a statutory "definition of death,"⁴ at the prompting of some members of the medical profession who apparently feel that existing, judicially-framed standards might expose physicians, particularly transplant surgeons, to civil or criminal liability.⁵ Although the leading statute in this area⁶ appears to create more problems than it resolves,⁷ some legislation may be needed for the protection of the public as well as the medical profession, and, in any event, many more states will probably be enacting such statutes in the near future.⁸

³ See, e.g., 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 *Irreversible Coma*]; Discussion of Murray, *Organ Transplantation: The Practical Possibilities*, in MEDICAL PROGRESS, *supra* note 1, at 69-74 (remarks of Drs. G. P. J. Alexandre, R. Y. Calne, J. Hamburger, J. E. Murray, J. P. Revillard & G. E. Schreiner); *When Is a Patient Dead?*, 204 J.A.M.A. 1000 (1968) (editorial); *Updating the Definition of Death*, MED. WORLD NEWS, Apr. 28, 1967, at 47.

In an earlier article, our Research Group appraised the proposed new medical criteria for the determination of death and discussed some of the sources of public concern. Task Force on Death and Dying, Institute of Society, Ethics and the Life Sciences, *Refinements in Criteria for the Determination of Death: An Appraisal*, 221 J.A.M.A. 48 (1972) [hereinafter cited as *Refinements in Criteria*]. In discussing the procedures used to establish the new criteria, the article concluded:

Clearly, these matters of decisionmaking and the role of law need further and widespread discussion. The acceptability of any new concept or criteria of death will depend at least as much on the acceptability of the procedure by which they are adopted as on their actual content.

Id. 53.

⁴ KAN. STAT. ANN. § 77-202 (Supp. 1971); MARYLAND SESSIONS LAWS ch. 693 (1972). Bills are presently pending in Florida, H. 551, 2d Fla. Legis. (n.s.) (1971), Illinois, H. 1586, 77th Gen. Assemb., 1st Sess. (1971), and Wisconsin, S. 550, Biennial Sess. (1971).

Section IV of this Article argues that terms such as "defining death" and "definition of death" are extremely ambiguous, and that the ambiguity is an important cause of misunderstanding and confusion regarding the propriety of legislation in this area. Though it would be desirable not to use such terms, they are too well established in professional and public discourse on these matters to be eliminated. For convenience, and often deliberately to emphasize the problem of ambiguity, we occasionally use these terms in quotation marks. For an explanation of four different levels of specificity which may be intended when the term "definition of death" is employed, see notes 57-60 *infra* & accompanying text.

⁵ See, e.g., Taylor, *A Statutory Definition of Death in Kansas*, 215 J.A.M.A. 296 (1971) (letter to the editor), in which the principal draftsman of the Kansas statute states that the law was believed necessary to protect transplant surgeons against the risk of "a criminal charge, for the existence of a resuscitated heart in another body should be excellent evidence that the donor was not dead [under the "definition" of death then existing in Kansas] until the operator excised the heart." Cf. Kapoor, *Death & Problems of Transplant*, 38 MAN. B. NEWS 167, 177 (1971); Baker, *Liability and the Heart Transplant*, 6 HOUSTON L. REV. 85, 97-101 (1968). The specter of civil liability was raised in *Tucker v. Lower*, a recent action brought by the brother of a heart donor against the transplantation team at the Medical College of Virginia. See notes 42-50 *infra* & accompanying text.

⁶ KAN. STAT. ANN. § 77-202 (Supp. 1971); see notes 74-88, 98-101 *infra* & accompanying text for a discussion of this statute.

⁷ See notes 74-85 *infra* & accompanying text.

⁸ In addition to the state medical societies, see Taylor, *supra* note 5, others have advocated a statutory definition of death. "Medical researchers and M.D.'s involved in transplants must break with their traditional reluctance to seek statutory changes in the definition of death or find themselves floundering in a morass of court suits in coming years." 15 DRUG RESEARCH REP., June 7, 1972, at 1. Moreover, once a statute is enacted

I. BACKGROUND

Courts and physicians can no longer assume that determining whether and when a person has died is always a relatively simple matter. The development and use of sophisticated machinery to maintain artificially both respiration and circulation has introduced difficulties in making this determination in some instances. In such cases, the use of a cardiac pacemaker or a mechanical respirator renders doubtful the significance of the traditional "vital signs" of pulse, heartbeat, and respiratory movements as indicators of continuing life. Similarly, the ability of an organ recipient to go on living after his own heart has been removed and replaced by another's has further undermined the status of the beating heart as one of the most reliable—if not *the* most reliable—signs that a person is still alive. In addition, the need of transplant surgeons to obtain organs in good condition from cadavers has stimulated the search for tests that would permit the death of the organism as a whole to be declared before the constituent organs have suffered extensive deterioration. Consequently, new criteria for judging a person dead have been proposed and are gaining acceptance among physicians. The most prominent are those formulated in 1968 by the Harvard Medical School's Ad Hoc Committee to Examine the Definition of Brain Death, chaired by Dr. Henry K. Beecher.⁹

The Harvard Committee described in considerable detail three criteria of "irreversible coma": (1) "unreceptivity and unresponsivity" to "externally applied stimuli and inner need"; (2) absence of spontaneous muscular movements or spontaneous respiration; and (3) no elicitable reflexes.¹⁰ In addition, a flat (isoelectric) electroencephalogram was held to be "of great confirmatory value" for the clinical diagnosis.¹¹ Although generally referred to as criteria for "cerebral

on a new subject in one state, there seem to be direct and indirect pressures for it to be viewed as a model for adoption in other states. Cf. *id.* 5, which notes that the Virginia statute allowing a medical examiner to provide a decedent's organs for transplantation is "the first of its kind in the nation" and terms it "a model for other states to emulate," when it is in fact poorly conceived and nearly incomprehensible.

⁹ See *Irreversible Coma*, *supra* note 3. In addition to Dr. Beecher, the committee consisted of nine other physicians, an historian, a lawyer, and a theologian, all Harvard University faculty members. *Id.*

¹⁰ *Id.* 337-38.

¹¹ The Harvard committee spelled out its central conclusions as follows:

An organ, brain or other, that no longer functions and has no possibility of functioning again is for all practical purposes dead. Our first problem is to determine the characteristics of a *permanently* nonfunctioning brain.

A patient in this state appears to be in deep coma. The condition can be satisfactorily diagnosed by points 1, 2, and 3 to follow. The electroencephalogram (point 4) provides confirmatory data, and when available it should be utilized. In situations where for one reason or another electroencephalographic monitoring is not available, the absence of cerebral function has to be determined by purely clinical signs, to be described, or by absence of circulation as judged by stand-still of blood in the retinal vessels, or by absence of cardiac activity.

death" or "brain death," these criteria assess not only higher brain functions but brainstem and spinal cord activity and spontaneous respiration as well. The accumulating scientific evidence indicates that patients who meet the Harvard criteria will not recover and on autopsy will be found to have brains which are obviously destroyed,¹²

1. *Unreceptivity and Unresponsivity*.—There is a total unawareness to externally applied stimuli and inner need and complete unresponsiveness—our definition of irreversible coma. Even the most intensely painful stimuli evoke no vocal or other response, not even a groan, withdrawal of a limb, or quickening of respiration.

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. (The respirator may be turned off for this time provided that at the start of the trial period the patient's carbon dioxide tension is within the normal range, and provided also that the patient has been breathing room air for at least 10 minutes prior to the trial.)

3. *No reflexes*.—Irreversible coma with abolition of central nervous system activity is evidenced in part by the absence of elicitable reflexes. The pupil will be fixed and dilated and will not respond to a direct source of bright light. Since the establishment of a fixed, dilated pupil is clear-cut in clinical practice, there should be no uncertainty as to its presence. Ocular movement (to head turning and to irrigation of the ears with ice water) and blinking are absent. There is no evidence of postural activity (decerebrate or other). Swallowing, yawning, vocalization are in abeyance. Corneal and pharyngeal reflexes are absent.

As a rule the stretch of tendon reflexes cannot be elicited; i.e., tapping the tendons of the biceps, triceps, and pronator muscles, quadriceps and gastrocnemius muscles with the reflex hammer elicits no contraction of the respective muscles. Plantar or noxious stimulation gives no response.

4. *Flat Electroencephalogram*.—Of great confirmatory value is the flat or isoelectric EEG. We must assume that the electrodes have been properly applied, that the apparatus is functioning normally, and that the personnel in charge is competent. We consider it prudent to have one channel of the apparatus used for an electrocardiogram. This channel will monitor the ECG so that, if it appears in the electroencephalographic leads because of high resistance, it can be readily identified. It also establishes the presence of the active heart in the absence of the EEG. We recommend that another channel be used for a noncephalic lead. This will pick up space-borne or vibration-borne artifacts and identify them. The simplest form of such a monitoring noncephalic electrode has two leads over the dorsum of the hand, preferably the right hand, so the ECG will be minimal or absent. Since one of the requirements of this state is that there be no muscle activity, these two dorsal hand electrodes will not be bothered by muscle artifact. The apparatus should be run at standard gains 10 μ v/mm, 50 μ v/5 mm. Also it should be isoelectric at double this standard gain which is 5 μ v/mm or 25 μ v/5 mm. At least ten full minutes of recording are desirable, but twice that would be better.

It is also suggested that the gains at some point be opened to their full amplitude for a brief period (5 to 100 seconds) to see what is going on. Usually in an intensive care unit artifacts will dominate the picture, but these are readily identifiable. There shall be no electroencephalographic response to noise or to pinch.

All of the above tests shall be repeated at least 24 hours later with no change.

The validity of such data as indications of irreversible cerebral damage depends on the exclusion of two conditions: hypothermia (temperature below 90 F. [32.2 C.]) or central nervous system depressants, such as barbiturates. *Irreversible Coma*, *supra* note 3, at 337-38.

¹² In the largest single study of patients with flat E.E.G.'s of twenty-four hours'

and supports the conclusion that these criteria may be useful for determining that death has occurred. The Harvard Committee's views were apparently well received in the medical community.¹³ Not all physicians have been enthusiastic, however. Professor David Rutstein of the Harvard Medical School, for example, expressed concern over "this major ethical change [which] has occurred right before our eyes . . . with little public discussion of its significance."¹⁴

Not surprisingly, disquiet over the change in medical attitude and practice arose in lay as well as medical circles.¹⁵ The prospect of physicians agreeing amongst themselves to change the rules by which life is measured in order to salvage a larger number of transplantable organs met with something short of universal approval.¹⁶ Especially with increasing disenchantment over heart transplantation (the procedure in which the traditional criteria for determining death posed the most difficulties), some doubt arose whether it was wise to adopt measures which encouraged a medical "advance" that seemed to have gotten ahead of its own basic technology. Furthermore, many people—doctors included—found themselves with nagging if often unarticulated doubts about how to proceed in the situation, far more com-

duration, which involved 2639 comatose patients without anesthetic doses of c.n.s. depressants, not one recovered. Silverman, Masland, Saunders & Schwab, *Irreversible Coma Associated with Electrocerebral Silence*, 20 NEUROLOGY 525 (1970). In an unreported study on 128 individuals who fulfilled the Harvard clinical criteria, postmortem examinations showed their brains to be destroyed. Unpublished results of E. Richardson, reported in *Refinements in Criteria*, *supra* note 3, at 50-51.

¹³ One member of the committee has observed that "since the publication of the report, the clinical recommendations have been accepted and followed on a worldwide basis in a most gratifying fashion." Curran, *Legal and Medical Death—Kansas Takes the First Step*, 284 NEW ENG. J. MED. 260 (1971). Dr. Beecher recently noted that legal doubts have prevented uniform acceptance of the Harvard Committee's views. "Almost every (doctor) on the East Coast has accepted irreversible brain damage as the criterion for death, whereas most West Coast physicians do not for fear of suits." Ross, *Death with Dignity*, The Washington Post, Aug. 9, 1972, at B-15, col. 1 (quoting Dr. Beecher); for a fuller account of the testimony, see *Hearings on Death with Dignity Before the Senate Special Comm. on Aging*, 92d Cong., 2d Sess. (1972).

¹⁴ Rutstein, *The Ethical Design of Human Experiments*, 98 DAEDALUS 523, 526 (1969). Leaders of the Netherlands Red Cross Society's Organ Transplantation Committee argue that only "total absence of the brain's functional capacity" and not "irreversible coma" indicates that death has occurred and state the Dutch position that the Harvard criteria "are grounds for stopping treatment and letting the patient die," but not for declaring death. Rot & van Till, *Neocortical Death after Cardiac Arrest*, 2 LANCET 1099-100 (1971) (letter to the editor).

¹⁵ See, e.g., Arnold, Zimmerman & Martin, *Public Attitudes and the Diagnosis of Death*, 206 J.A.M.A. 1949 (1968) [hereinafter cited as Arnold]; Björck, *When is Death?*, 1968 WIS. L. REV. 484, 490-91; N.Y. Times, Sept. 9, 1968, at 23, col. 1 (quoting Drs. F. C. Spencer & J. Hardy); *The Heart: Miracle in Cape Town*, NEWSWEEK, Dec. 18, 1967, at 86-87.

¹⁶ [C]ertain actions by transplant surgeons in establishing time of death on death certificates and hospital records have shaken public confidence. Coroners have denounced them in the press for signing a death certificate in one county when the beating heart was removed a day later in a far-off city. The public wonders what the "item" was that was transplanted across the state line and later registered as a person in the operating room record.

Corday, *Life-Death in Human Transplantation*, 55 A.B.A.J. 629, 632 (1969).

mon than transplantation, in which a long-comatose patient shows every prospect of "living" indefinitely with artificial means of support.¹⁷ As a result of this growing public and professional concern, elected officials,¹⁸ with the encouragement of the medical community,¹⁹ have urged public discussion and action to dispel the apprehension created by the new medical knowledge and to clarify and reformulate the law. Some commentators, however, have argued that public bodies and laymen in general have no role to play in this process of change.²⁰ Issue is therefore joined on at least two points: (1) ought the public to be involved in "defining" death? and (2) if so, how ought it to be involved—specifically, ought governmental action, in the form of legislation, be taken?²¹

II. PUBLIC INVOLVEMENT OR PROFESSIONAL PREROGATIVE?

In considering the possible need for and the desirability of public involvement, the central question appears to be to what extent, if at all, the "defining" of death is a medical matter, properly left to physicians because it lies within their particular sphere of competence. The belief that the matter of "defining death" is wholly medical is frequently expressed, and not only by physicians.²² Indeed, when a

¹⁷ [M]any people are now maintained in a sort of twilight state by the use of machines which do the work of their lungs or their heart while they are completely unconscious Many of these people will never resume an independent existence away from the machines One has to decide therefore when to switch off the machines, and this question arises quite independently of considerations about transplants.

Discussion of Murray, Organ Transplantation: The Practical Possibilities, in MEDICAL PROGRESS, *supra* note 1, at 71 (comments of Dr. M. F. A. Woodruff).

¹⁸ See, e.g., Mondale, *Health Science and Society*, 117 CONG. REC. S3708 (daily ed. Mar. 24, 1971); H. Res. 2830, 2d Fla. Legis. (n.s.) (1971) (resolution introduced by Rep. Sackett, M.D., to create a commission to study death).

¹⁹ See, e.g., Taylor, *supra* note 5, at 296; Arnold, *supra* note 15, at 1954; Corday, *Definition of Death: A Double Standard*, HOSPITAL TRIBUNE, May 4, 1970, at 8; Halley & Harvey, *On an Interdisciplinary Solution to the Legal-Medical Definitional Dilemma in Death*, 2 INDIANA LEGAL F. 219, 227 (1969).

²⁰ See, e.g., Kennedy, *The Kansas Statute on Death: An Appraisal*, 285 NEW ENG. J. MED. 946 (1971); *What and When is Death?*, 204 J.A.M.A. 539, 540 (1968) (editorial).

²¹ To some extent this formulation of the problem is, of course, unrealistic, since "public action" (i.e., action by an official public body), in the form of a court decision, can come about at the instance of a private litigant regardless of any policy reasons in favor of public inaction. Although it may therefore be impossible to avoid creating "law" on the subject, there might still be no significant public involvement if the courts restricted themselves merely to endorsing conclusions reached by private groups, such as those representing physicians. Kennedy's support for judicial involvement in "defining" death seems to operate on that premise. See Kennedy, *supra* note 20, at 947. See also note 36 *infra* & accompanying text.

²² See, e.g., Kennedy, *supra* note 20, at 947; Berman, *The Legal Problems of Organ Transplantation*, 13 VILL. L. REV. 751, 754 (1968); Sanders & Dukeminier, *Medical Advance and Legal Lag: Hemodialysis and Kidney Transplantation*, 15 U.C.L.A.L. REV. 357, 409 (1968) [hereinafter cited as Sanders]; NATIONAL CONFERENCE OF COMMISSIONERS ON UNIFORM STATE LAWS, HANDBOOK AND PROCEEDINGS OF THE ANNUAL CON-

question concerning the moment at which a person died has arisen in litigation, common law courts have generally regarded this as "a question of fact" for determination at trial on the basis (partially but not exclusively) of expert medical testimony.²³ Yet the standards which are applied in arriving at a conclusion, although based on medical knowledge, are established by the courts "as a matter of law."²⁴

Thus while it is true that the application of particular criteria or tests to determine the death of an individual may call for the expertise of a physician, there are other aspects of formulating a "definition" of death that are not particularly within medical competence. To be sure, in practice, so long as the standards being employed are stable and congruent with community opinion about the phenomenon of death,

ERENCE 192 (1968); cf. Sadler, Sadler & Stason, *The Uniform Anatomical Gift Act: A Model for Reform*, 206 J.A.M.A. 2501 (1968). The ad hoc Harvard Committee, composed largely of physicians, came to the same conclusion. See *Irreversible Coma*, *supra* note 3, at 339.

²³ See *Thomas v. Anderson*, 96 Cal. App. 2d 371, 215 P.2d 478 (1950). In that appeal, the court was called upon to decide whether the trial judge had erred in holding inapplicable to the case a provision of the California Probate Code based on the Uniform Simultaneous Death Act which provided for the equal distribution of the property of two joint tenants "[w]here there is no sufficient evidence that [they] have died otherwise than simultaneously . . ." The court cited the definition in *Black's Law Dictionary* that "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.," and went on to observe that "death occurs precisely when life ceases and does not occur until the heart stops beating and respiration ends. Death is not a continuing event and is an event that takes place at a precise time." *Id.* at 375, 215 P.2d at 482. It concluded that the "question of fact" as to which of the two deceased men died first had been correctly determined by the trial court in light of "sufficient evidence" given by nonmedical witnesses concerning the appearance of the men on the evening in question.

²⁴ *Smith v. Smith*, 229 Ark. 579, 587, 317 S.W.2d 275, 279 (1958) (quoting 41 AM. JUR. *Husbands and Wives* § 244 (1938)). The Smiths, a childless couple who by will had each left his or her estate to the other, were involved in an automobile accident. Mr. Smith apparently died immediately, but when assistance arrived Mrs. Smith was unconscious, and she remained so in the hospital for seventeen days. Thereafter, Mr. Smith's administrator petitioned for the construction of the wills, alleging:

That as a matter of modern medical science, your petitioner . . . will offer the Court competent proof that the [Smiths] lost their power to will at the same instant, and that their demise as earthly human beings occurred at the same time in said automobile accident, neither of them ever regaining any consciousness whatsoever.

Id. at 582, 317 S.W.2d at 277. The Supreme Court of Arkansas upheld the trial court's dismissal of the petition as a matter of law on the ground that "it would be too much of a strain on credulity for us to believe any evidence offered to the effect that Mrs. Smith was dead, scientifically or otherwise, unless the conditions set out in the [Black's Law Dictionary (4th ed.)] definition existed." *Id.* at 586-87, 317 S.W.2d at 279. The court took "judicial notice that one breathing, though unconscious, is not dead," *id.* at 589, 317 S.W.2d at 281, and concluded that Mrs. Smith's death was therefore not simultaneous with her husband's.

Cf. *In re Estate of Schmidt*, 261 Cal. App. 2d 262, 67 Cal. Rptr. 847 (1968). *Schmidt*, like *Thomas and Smith*, involved an inheritance issue under the Uniform Simultaneous Death Act. The court of appeals found that there was sufficient eyewitness testimony by laymen to support the trial court's conclusion that Mrs. Schmidt survived her husband by some minutes, and it found no fault in the use of the *Black's Law Dictionary* "definition of death" despite the argument that it "is an anachronism in view of the recent medical developments relating to heart transplants," since there was no evidence that the deceased were resuscitable. *Id.* at 273, 67 Cal. Rptr. at 854 (dictum).

most people are content to leave the matter in medical hands.²⁵ But the underlying extra-medical aspects of the "definition" become visible, as they have recently, when medicine departs (or appears to depart) from the common or traditional understanding of the concept of death. The formulation of a concept of death is neither simply a technical matter nor one susceptible of empirical verification. The idea of death is at least partly a philosophical question, related to such ideas as "organism," "human," and "living." Physicians *qua* physicians are not expert on these philosophical questions, nor are they expert on the question of which physiological functions decisively identify a "living, human organism." They, like other scientists, can suggest which "vital signs" have what significance for which human functions. They may, for example, show that a person in an irreversible coma exhibits "total unawareness to externally applied stimuli and inner need and complete unresponsiveness,"²⁶ and they may predict that when tests for this condition yield the same results over a twenty-four hour period there is only a very minute chance that the coma will ever be "reversed."²⁷ Yet the judgment that "total unawareness . . . and complete unresponsiveness" are the salient characteristics of death, or that a certain level of risk of error is acceptable, requires more than technical expertise and goes beyond medical authority, properly understood.

The proposed departure from the traditional standards for determining death not only calls attention to the extra-medical issues involved, but is itself a source of public confusion and concern. The confusion can perhaps be traced to the fact that the traditional signs of life (the beating heart and the expanding chest) are manifestly accessible to the senses of the layman, whereas some of the new criteria require sophisticated intervention to elicit latent signs of life such as brain reflexes. Furthermore, the new criteria may disturb the layman by suggesting that these visible and palpable traditional signs, still useful in most cases, may be deceiving him in cases where supportive machinery is being used. The anxiety may also be attributable to the apparent intention behind the "new definition," which is, at least in part, to facilitate other developments such as the transplantation of cadaver organs. Such confusion and anxiety about the standards for determining death can have far-reaching and distressing consequences for the patient's family, for the physician, for other patients, and for

²⁵ See Arnold, *supra* note 15, at 1950, in which the public's "nearly complete acceptance" of professional practice in this century until cardiac transplantation began is contrasted with the great concern manifested in the 19th century and earlier, before embalming became routine, largely because of the fear of premature burial.

²⁶ *Irreversible Coma*, *supra* note 3, at 337.

²⁷ See note 12 *supra*.

the community at large.²⁸ If the uncertainties surrounding the question of determining death are to be laid to rest, a clear and acceptable standard is needed. And if the formulation and adoption of this standard are not to be abdicated to the medical fraternity under an expanded view of its competence and authority, then the public and its representatives ought to be involved.²⁹ Even if the medical profession takes the lead—as indeed it has—in promoting new criteria of death, members of the public should at least have the opportunity to review, and either to affirm or reject the standards by which they are to be pronounced dead.

III. WHAT MANNER OF PUBLIC INVOLVEMENT?

There are a number of potential means for involving the public in this process of formulation and review, none of them perfect. The least ambitious or comprehensive is simply to encourage discussion of the issues by the lay press, civic groups, and the community at large. This public consideration might be directed or supported through the efforts of national organizations such as the American Medical Association, the National Institutes of Health, or the National Academy of Sciences.³⁰ A resolution calling for the establishment of an ad hoc body to evaluate public attitudes toward the changes wrought by biomedical advances has been sponsored by Senator Mondale since 1967 and was adopted by the Senate in December 1971.³¹ Mondale's proposed National Advisory Commission on Health Science and Society,

²⁸ See Sanders, *supra* note 22, at 407-09; 3 M. HOUTS & I.H. HAUT, *COURTROOM MEDICINE* §§ 1.02(3)(a)-(g) (1971). As long as the legal standard is ambiguous, the possibility exists that the processes of criminal, as well as civil, justice will be impeded. See, e.g., D. MEYERS, *THE HUMAN BODY AND THE LAW* 116-18 (1970) (discussing an unreported British case, *Regina v. Potter*, in which a manslaughter defendant was convicted of common assault upon proof that surgeons had removed a kidney from the decedent while he was being maintained on a respirator and before he had been found to be "dead"); *Trial to Test M.D.'s Role in Death of Heart Donor*, A.M.A. News, Nov. 11, 1968, at 2 (man charged with manslaughter raised as defense surgeons' removal of victim's heart when he was kept alive by artificial means).

²⁹ Matte, *Law, Morals, and Medicine: A Method of Approach to Current Problems*, 13 J. FOR. SCI. 318, 331-32 (1968). See also note 19 *supra*.

A theoretical risk of illegal conduct exists in the present state of the law. The law is apparently waiting for a social and theological consensus on this point [of "defining" death] The theologians, the philosophers and the physicians will have to formulate the judgment of propriety here before it is crystallized into a definite statutory rule.
Discussion of Louisell, *Transplantation: Existing Legal Constraints*, in *MEDICAL PROGRESS*, *supra* note 1, at 99 (comments of Prof. D. W. Louisell).

³⁰ For example, early in the debate over heart replacement the Board on Medicine of the National Academy issued a "Statement on Cardiac Transplantation," but addressed itself primarily to the need for caution in the spread of the operation to medical centers which were not suited to carrying it out scientifically. 18 NEWS REPORT OF THE NATIONAL ACADEMY OF SCIENCES 1 (Mar. 1968).

³¹ S.J. Res. 75, 92d Cong., 1st Sess. (1971), in 117 CONG. REC. S20,039-93 (daily ed. Dec. 2, 1971). See also note 18 *supra*. The joint resolution is now in the House Committee on Interstate Commerce.

under the direction of a board of fifteen members of the general public and professionals from "medicine, law, theology, biological science, physical science, social science, philosophy, humanities, health administration, government, and public affairs," would conduct "seminars and public hearings" as part of its two-year study.³² As important as it is to ventilate the issues, studies and public discussions alone may not be adequate to the task. They cannot by themselves dispel the ambiguities which will continue to trouble decisionmakers and the public in determining whether an artificially-maintained, comatose "patient" is still alive.

A second alternative, reliance upon the judicial system, goes beyond ascertaining popular attitudes and could provide an authoritative opinion that might offer some guidance for decisionmakers. Reliance on judge-made law would, however, neither actively involve the public in the decisionmaking process nor lead to a prompt, clear, and general "definition." The courts, of course, cannot speak in the abstract prospectively, but must await litigation, which can involve considerable delay and expense, to the detriment of both the parties and society. A need to rely on the courts reflects an uncertainty in the law which is unfortunate in an area where private decisionmakers (physicians) must act quickly and irrevocably. An ambiguous legal standard endangers the rights—and in some cases the lives—of the participants. In such circumstances, a person's choice of one course over another may depend more on his willingness to test his views in court than on the relative merits of the courses of action.³³

Once called upon to "redefine" death—for example, in a suit brought by a patient's relatives or, perhaps, by a revived "corpse" against the physician declaring death—the judiciary may be as well qualified to perform the task as any governmental body. If the issue could be resolved solely by a process of reasoning and of taking "judicial notice" of widely known and uncontroverted facts, a court could handle it without difficulty. If, on the other hand, technical expertise is required problems may arise. Courts operate within a limited compass—the facts and contentions of a particular case—and with limited expertise; they have neither the staff nor the authority to investigate

³² S.J. Res. 75, 92d Cong., 1st Sess. (1971), in 117 CONG. REC. S20,090 (daily ed. Dec. 2, 1971).

³³ For example, suppose that transplant surgeons were willing to employ a neurological definition of death, although most other physicians continued to use the "traditional" definition because of the unsettled nature of the law. If (*ex hypothesi*) those surgeons were less averse to the risks of testing their position in litigation, because of their temperament, training, values and commitments, or desire for success, their "courage" could lead to patients being declared dead prematurely according to the traditional standard.

or to conduct hearings in order to explore such issues as public opinion or the scientific merits of competing "definitions."³⁴ Consequently, a judge's decision may be merely a rubberstamping of the opinions expressed by the medical experts who appear before him.³⁵ Indeed, those who believe that the "definition of death" should be left in the hands of physicians favor the judicial route over the legislative on the assumption that, in the event of a law suit, the courts will approve "the consensus view of the medical profession"³⁶ in favor of the new standards. Leaving the task of articulating a new set of standards to the courts may prove unsatisfactory, however, if one believes, as suggested previously, that the formulation of such standards, as opposed to their application in particular cases, goes beyond the authority of the medical profession.³⁷

Uncertainties in the law are, to be sure, inevitable at times and are often tolerated if they do not involve matters of general applicability or great moment. Yet the question of whether and when a person is dead plainly seems the sort of issue that cannot escape the need for legal clarity on these grounds. Therefore, it is not surprising that although they would be pleased simply to have the courts endorse their views, members of the medical profession are doubtful that the judicial mode of lawmaking offers them adequate protection in this area.³⁸ There is currently no way to be certain that a doctor would not be liable, criminally or civilly, if he ceased treatment of a person found to be dead according to the Harvard Committee's criteria but not according to the "complete cessation of all vital functions" test presently employed by the courts. Although such "definitions" were adopted in cases involving inheritors' rights and survivorship³⁹ rather than a doctor's liability for exercising his judgment about when a person has died, physicians have with good reason felt that this affords

³⁴ See, e.g., *Repouille v. United States*, 165 F.2d 152, 153 (2d Cir. 1947) (L. Hand, J.), 154 (Frank, J., dissenting).

³⁵ Because of the adversary nature of the judicial process, testimony is usually restricted to the "two sides" of an issue and may not fairly represent the spectrum of opinion held by authorities in the field.

³⁶ Kennedy, *supra* note 20, at 947. Kennedy's reliance on a medical "consensus" has a number of weaknesses, which he himself seems to acknowledge: (1) there may be "a wide range of opinions" held by doctors, so that "there need not necessarily be only one view" on a subject which is supported by the medical community, in part because (2) the "usual ways" for these matters to be "discussed and debated" are not very clear or rigorous since (3) the "American medical profession is not all that well regulated" unlike its British counterpart and (4) is not organized to give "official approval" to a single position or (5) to give force to its decision, meaning (6) that "the task will be assumed by some other body, most probably the legislature." *Id.*

³⁷ Cf. *Blocker v. United States*, 288 F.2d 853, 860 (D.C. Cir. 1961) (en banc) (Burger, J., concurring in the result) (criticizing psychiatrists' attempt to alter legal definition of "mental disease").

³⁸ See note 19 *supra*.

³⁹ See notes 23-24 *supra*; cf. *Gray v. Sawyer*, 247 S.W.2d 496 (Ky. 1952).

them little assurance that the courts would not rely upon those cases as precedent.⁴⁰ On the contrary, it is reasonable to expect that the courts would seek precedent in these circumstances. Adherence to past decisions is valued because it increases the likelihood that an individual will be treated fairly and impartially; it also removes the need to relitigate every issue in every case. Most importantly, courts are not inclined to depart from existing rules because to do so may upset the societal assumption that one may take actions, and rely upon the actions of others, without fear that the ground rules will be changed retroactively.⁴¹

Considerations of precedent as well as other problems with relying on the judicial formulation of a new definition were made apparent in *Tucker v. Lower*,⁴² the first case to present the question of the "definition of death" in the context of organ transplantation. Above all, this case demonstrates the uncertainty that is inherent in the process of litigation, which "was touch and go for the medical profession"⁴³ as well as the defendants. *Tucker* involved a \$100,000 damage action against Drs. David Hume and Richard Lower and other defendant doctors on the Medical College of Virginia transplant team, brought by William E. Tucker, whose brother's heart was removed on May 25, 1968, in the world's seventeenth human heart transplant. The plaintiff claimed that the heart was taken without approval of the next of kin and that the operation was commenced before his brother had died. On the latter point, William Tucker offered evidence that his brother was admitted to the hospital with severe head injuries sustained in a fall and that after a neurological operation he was placed on a respirator. At the time he was taken to the operating room to have his organs removed "he maintained vital signs of life, that is, . . . normal body temperature, normal pulse, normal blood

⁴⁰ See Taylor, *supra* note 5, at 296. But cf. Kennedy, *supra* note 20, at 947.

⁴¹ "[R]ules of law on which men rely in their business dealings should not be changed in the middle of the game . . ." Woods v. Lancet, 303 N.Y. 349, 354, 102 N.E.2d 691, 695 (1951). It must be admitted, however, that such principles usually find their most forceful articulation when the court is about to proceed on the counter-principle that when necessary the common law will change with the times to achieve justice. (In *Woods*, for example, the New York Court of Appeals overruled its prior decision in *Drobner v. Peters*, 232 N.Y. 220, 133 N.E. 567 (1921), in order to permit a child to sue for prenatal injuries.) Although in this country, at least, strict adherence to precedent has been less true on the civil side than on the criminal (where the courts hold closer to the doctrine of *nullum crimen sine lege* than do English courts), it is probably fair to state that judges are more likely to depart from precedent in order to create a new cause of action than they are to reject an existing standard and thereby destroy a cause; to adjust the "definition of death" to the perhaps changing views of the medical profession would be to derogate the rights of those litigants injured by declarations of death which departed from previously accepted standards.

⁴² *Tucker v. Lower*, No. 2831 (Richmond, Va., L. & Eq. Ct., May 23, 1972).

⁴³ 15 DRUG RESEARCH REP., June 7, 1972, at 1.

pressure and normal rate of respiration.”⁴⁴ Based on the neurologist’s finding that the brother was dead from a neurological standpoint, the respirator was turned off and he was pronounced dead. The defendants moved to strike the plaintiff’s evidence and for summary judgment in their favor, but the trial judge denied the motions.

The function of This Court is to determine the state of the law on this or any other subject according to legal precedent and principle. The courts which have had occasion to rule upon the nature of death and its timing have all decided that death occurs at a precise time, and that it is defined as the cessation of life; the ceasing to exist; a total stoppage of the circulation of the blood, and a cessation of the animal and vital functions consequent thereto such as respiration and pulsation.⁴⁵

The court adhered to “the legal concept of death” and rejected “the invitation offered by the defendants to employ a medical concept of neurological death in establishing a rule of law.”⁴⁶ The court ruled that the jury would be allowed to assess damages if it concluded “that the decedent’s life was terminated at a time earlier than it would ordinarily have ended had all reasonable medical efforts been continued to prolong his life.”⁴⁷

When he sent the case to the jurors, however, the judge permitted them to consider all possible causes of death, including injury to the brain as well as cessation of breathing or heartbeat, and a verdict was returned for the defendants. Unfortunately, the discrepancy between the initial ruling and the subsequent instructions to the jury did little to resolve the legal uncertainty. The plaintiff has announced that he plans to appeal to the Supreme Court of Virginia,⁴⁸ and the creation of a clear and binding rule will depend on the action of that court.⁴⁹

In declining the defendants’ suggestion that he adopt a standard

⁴⁴ *Tucker v. Lower*, No. 2831, at 4 (Richmond, Va., L. & Eq. Ct., May 23, 1972).

⁴⁵ *Id.* at 8 (citations omitted).

⁴⁶ *Id.*

While it is recognized that none of the cases cited above involved transplants, to employ a different standard in this field would create chaos in other fields of the law and certainly it cannot be successfully argued that there should be one concept of death which applies to one type of litigation while an entirely different standard applies in other areas.

Id. at 8-9.

⁴⁷ *Id.* at 11.

⁴⁸ *N.Y. Times*, May 27, 1972, at 15, col. 5; *id.*, June 4, 1972, § 4, at 7, col. 1.

⁴⁹ As one medical journal, which favors legislative formulation of a “definition,” said of the decision of the Richmond court: “It applies only to cases coming before that court and can be reversed on appeal or overridden by contrary decisions handed down in higher courts.” 15 *DRUG RESEARCH REP.*, June 7, 1972, at 1.

based on neurological signs, the judge stated that application for "such a radical change" in the law should be made "not to the courts but to the legislature wherein the basic concepts of our society relating to the preservation and extension of life could be examined and, if necessary, reevaluated."⁵⁰ A statutory "definition" of death would have notable advantages as an alternative to a judicial promulgation. Basically, the legislative process permits the public to play a more active role in decisionmaking and allows a wider range of information to enter into the framing of criteria for determining death. Moreover, by providing prospective guidance, statutory standards could dispel public and professional doubt, and could provide needed reassurance for physicians and patients' families, thereby reducing both the fear and the likelihood of litigation for malpractice (or even for homicide).

The legislative alternative also has a number of drawbacks, however. Foremost among these is the danger that a statute "defining" death may be badly drafted. It may be either too general or too specific, or it may be so poorly worded that it will leave physicians or laymen unsure of its intent. There is also the danger that the statutory language might seem to preclude future refinements that expanding medical knowledge would introduce into the tests and procedures for determining death. The problem of bad draftsmanship is compounded by the fact that a statute once enacted may be difficult to revise or repeal, leaving to the slow and uncertain process of litigation the clarification of its intent and meaning.⁵¹ By contrast, although judges usually espouse the doctrine of *stare decisis*, flexibility over time is a hallmark of the common law. An additional practical problem is the possibility that the statutes enacted may reflect primarily the interests of powerful lobbying groups—for example, state medical societies or transplant surgeons. This possibility—similar to the danger of judicial "rubberstamping" of medical experts' opinions—may be avoided by legislatures' holding open and well-publicized hearings at which sociologists, lawyers, theologians, and representatives of various viewpoints are also called upon to testify.

Professor Ian Kennedy has suggested the further danger that a statutory "definition," rather than protecting the public may leave it vulnerable to physicians who through "liberal interpretation and clever argument" might take actions "just within the letter if not the spirit of the law."⁵² Kennedy would rely instead on the medical profession's

⁵⁰ *Tucker v. Lower*, No. 2831, at 10 (Richmond, Va., L. & Eq. Ct., May 23, 1972).

⁵¹ The general durability of statutes has the backhanded advantage, however, of emphasizing for the public as well as for legislators the importance of a thorough thrashing out of the issues in hearings and legislative debates.

⁵² Kennedy, *supra* note 20, at 947.

generalized "consensus view"⁵³ of the proper "definition of death." It is, however, far from clear why physicians who would violate a statute are unlikely to depart from such an informal "consensus," which may or may not eventually be sanctioned by the courts. Legislation will not remove the need for reasoned interpretation—first by physicians and perhaps then by judges—but it can restrict the compass within which they make their choices to one which has been found acceptable by the public.

Finally, the legislative route may reduce the likelihood that conflicting "definitions" of death will be employed in different jurisdictions in this country. Theoretically, uniformity is also possible in judicial opinions, but it occurs infrequently. If the formulation and reception of the Uniform Anatomical Gift Act provide any precedent, the Commissioners on Uniform State Laws appear to be well situated to provide leadership in achieving an intelligent response to changes in medical procedure.⁵⁴

In sum, then, official action, as opposed to mere discussion of the issues, is needed if the conflict between current medical practice and present law is to be eliminated. A reformulation of the standards for determining death should thus be undertaken by either courts or legislatures. There are strengths and weaknesses in both law-creating mechanisms, but on balance we believe that if legislators approach the issues with a critical and inquiring attitude, a statutory "definition" of death may be the best way to resolve the conflicting needs for definiteness and flexibility, for public involvement and scientific accuracy.⁵⁵ Moreover, since pressures for a legislative response to the problem appear to be mounting,⁵⁶ careful examination of the proper scope and content of such a statute seems to be called for.

⁵³ *Id.*

⁵⁴ Completed in July 1968 by the Commissioners on Uniform State Laws and approved by the American Bar Association in August of that year, the Uniform Anatomical Gift Act was adopted with only minor changes in 40 jurisdictions including the District of Columbia in 1969; by the end of 1971, the Act had been adopted in the remaining 11 states. For a detailed discussion of the national acceptance of the Act see Sadler, Sadler & Stason, *Transplantation and the Law: Progress Toward Uniformity*, 282 NEW ENG. J. MED. 717 (1970). See also Brickman, *Medico-Legal Problems with the Question of Death*, 5 CALIF. W.L. REV. 110, 122 (1968) (urging Commissioners to draft uniform act on "the procedures for determining death").

⁵⁵ This is, of course, not to say that a judge faced with a case to decide should hold back from engaging in the sort of analysis, or reaching the conclusions about a proper "definition," presented here. As Professor Clarence Morris once observed, the age-old argument that a legislature has a "superior opportunity" to frame general rules should not foreclose judicial reform of the law where the legislature has failed to act. A judge has, after all, "no reliable way of knowing" that legislative action will ever be forthcoming, and if he acts in a way the legislature finds erroneous, his mistake can be set right by statute. Morris, *Liability for Pain and Suffering*, 59 COLUM. L. REV. 476, 482 (1959).

⁵⁶ See note 8 *supra*. It would certainly be preferable for state legislatures and the Uniform Act Commissioners to begin work on laws now, rather than risking the enactment

IV. WHAT CAN AND SHOULD BE LEGISLATED?

Arguments both for and against the desirability of legislation "defining" death often fail to distinguish among the several different subjects that might be touched on by such legislation. As a result, a mistaken impression may exist that a single statutory model is, and must be, the object of debate. An appreciation of the multiple meanings of a "definition of death" may help to refine the deliberations.

Death, in the sense the term is of interest here, can be defined purely formally as the transition, however abrupt or gradual, between the state of being alive and the state of being dead.⁵⁷ There are at least four levels of "definitions" that would give substance to this formal notion; in principle, each could be the subject of legislation: (1) the basic concept or idea; (2) general physiological standards; (3) operational criteria; and (4) specific tests or procedures.⁵⁸

The *basic concept* of death is fundamentally a philosophical matter. Examples of possible "definitions" of death at this level include "permanent cessation of the integrated functioning of the organism as a whole," "departure of the animating or vital principle," or "irreversible loss of personhood." These abstract definitions offer little concrete help in the practical task of determining whether a person has died, but they may very well influence how one goes about devising standards and criteria.

In setting forth the *general physiological standard(s)* for recognizing death, the definition moves to a level which is more medico-technical, but not wholly so. Philosophical issues persist in the choice to define death in terms of organ systems, physiological functions, or recognizable human activities, capacities, and conditions. Examples of possible general standards include "irreversible cessation of spontaneous respiratory and/or circulatory functions," "irreversible loss of

of "emergency legislation hastily contrived in response to public pressure and emotional reaction to [a] particular medical calamity." Matte, *supra* note 29, at 332; cf. Woodside, *Organ Transplantation: The Doctor's Dilemma and the Lawyer's Responsibility*, 31 OHIO ST. L.J. 66, 96 (1970).

⁵⁷ For a debate on the underlying issues see Morison, *Death: Process or Event?*, 173 SCIENCE 694 (1970); Kass, *Death as an Event: A Commentary on Robert Morison*, 173 SCIENCE 698 (1971).

⁵⁸ To our knowledge, this delineation of four levels has not been made elsewhere in the existing literature on this subject. Therefore, the terms "concept," "standard," "criteria," and "tests and procedures" as used here bear no necessary connection to the ways in which others may use these same terms, and in fact we recognize that in some areas of discourse, the term "standards" is more, rather than less, operational and concrete than "criteria"—just the reverse of our ordering. Our terminology was selected so that the category we call "criteria" would correspond to the level of specificity at which the Ad Hoc Harvard Committee framed its proposals, which it called and which are widely referred to as the "new criteria" for determining death. We have attempted to be consistent in our use of these terms throughout this Article. Nevertheless, our major purpose here is not to achieve public acceptance of our terms, but to promote awareness of the four different levels of a "definition" of death to which the terms refer.

spontaneous brain functions," "irreversible loss of the ability to respond or communicate," or some combination of these.

Operational criteria further define what is meant by the general physiological standards. The absence of cardiac contraction and lack of movement of the blood are examples of traditional criteria for "cessation of spontaneous circulatory functions," whereas deep coma, the absence of reflexes, and the lack of spontaneous muscular movements and spontaneous respiration are among criteria proposed for "cessation of spontaneous brain functions" by the Harvard Committee.⁵⁹

Fourth, there are the *specific tests and procedures* to see if the criteria are fulfilled. Pulse, heart beat, blood pressure, electrocardiogram, and examination of blood flow in the retinal vessels are among the specific tests of cardiac contraction and movement of the blood. Reaction to painful stimuli, appearance of the pupils and their responsiveness to light, and observation of movement and breathing over a specified time period are among specific tests of the "brain function" criteria enumerated above.

There appears to be general agreement that legislation should not seek to "define death" at either the most general or the most specific levels (the first and fourth). In the case of the former, differences of opinion would seem hard to resolve, and agreement, if it were possible, would provide little guidance for practice.⁶⁰ In the case of the latter, the specific tests and procedures must be kept open to changes in medical knowledge and technology. Thus, arguments concerning the advisability and desirability of a statutory definition of death are usually confined to the two levels we have called "standards" and "criteria," yet often without any apparent awareness of the distinction between them. The need for flexibility in the face of medical advance would appear to be a persuasive argument for not legislating any specific operational criteria. Moreover, these are almost exclusively technical matters, best left to the judgment of physicians. Thus, the kind of "definition" suitable for legislation would be a definition of the general physiological standard or standards. Such a definition, while not immutable, could be expected to be useful for a long period of time and would therefore not require frequent amendment.

There are other matters that could be comprehended in legislation "defining" death. The statute could specify who (and how many) shall make the determination. In the absence of a compelling reason to

⁵⁹ See notes 3, 10 *supra*.

⁶⁰ Cf. Robertson, *Criteria of Death*, 175 SCIENCE 581 (1972) (letter to the editor).

change past practices, this may continue to be set at "a physician,"⁶¹ usually the doctor attending a dying patient or the one who happens to be at the scene of an accident. Moreover, the law ought probably to specify the "time of death." The statute may seek to fix the precise time when death may be said to have occurred, or it may merely seek to define a time that is clearly after "the precise moment," that is, a time when it is possible to say "the patient is dead," rather than "the patient has just now died." If the medical procedures used in determining that death has occurred call for verification of the findings after a fixed period of time (for example, the Harvard Committee's recommendation that the tests be repeated after twenty-four hours), the statute could in principle assign the "moment of death" to either the time when the criteria were first met or the time of verification. The former has been the practice with the traditional criteria for determining death.⁶²

Finally, legislation could speak to what follows upon the determination. The statute could be permissive or prescriptive in determining various possible subsequent events, including especially the pronouncement and recording of the death, and the use of the body for burial or other purposes.⁶³ It is our view that these matters are best handled outside of a statute which has as its purpose to "define death."⁶⁴

V. PRINCIPLES GOVERNING THE FORMULATION OF A STATUTE

In addition to carefully selecting the proper degree of specificity for legislation, there are a number of other principles we believe should guide the drafting of a statute "defining" death. First, the phenomenon of interest to physicians, legislators, and laymen alike is human death. Therefore, the statute should concern the death of a human being,

⁶¹ Cf. UNIFORM ANATOMICAL GIFT ACT § 7(b).

⁶² See note 99 *infra* & accompanying text.

⁶³ If . . . sound procedures for stating death are agreed to and carried out, then theologians and moralists and every other thoughtful person should agree with the physicians who hold that it is *then* permissible to maintain circulation of blood and supply of oxygen in the corpse of a donor to preserve an *organ* until it can be used in transplantation. Whether one gives the body over for decent burial, performs an autopsy, gives the cadaver for use in medical education, or uses it as a "vital organ bank" are all alike procedures governed by decent respect for the bodies of deceased men and specific regulations that ensure this. The ventilation and circulation of organs for transplant raises no question not already raised by these standard procedures. None are life-and-death matters. P. RAMSEY, *THE PATIENT AS PERSON* 72 (1970).

⁶⁴ Nevertheless, a statutory "definition" of death would most appropriately be codified with the provisions on the procedures to be followed to certify death, undertake post-mortem examinations, and so forth. For the reasons given below, the statute "defining" death ought not to be appended to the Uniform Anatomical Gift Act or other "special purpose" laws, however. See notes 65, 79-80 *infra* & accompanying text.

not the death of his cells, tissues or organs, and not the "death" or cessation of his role as a fully functioning member of his family or community. This point merits considerable emphasis. There may be a proper place for a statutory standard for deciding when to turn off a respirator which is ventilating a patient still clearly alive, or, for that matter, to cease giving any other form of therapy.⁶⁵ But it is crucial to distinguish this question of "when to allow to die?" from the question with which we are here concerned, namely, "when to declare dead?" Since very different issues and purposes are involved in these questions, confusing the one with the other clouds the analysis of both. The problem of determining when a person is dead is difficult enough without its being tied to the problem of whether physicians, or anyone else, may hasten the death of a terminally-ill patient, with or without his consent or that of his relatives, in order to minimize his suffering or to conserve scarce medical resources.⁶⁶ Although the same set of social and medical conditions may give rise to both problems, they must be kept separate if they are to be clearly understood.

Distinguishing the question "is he dead?" from the question "should he be allowed to die?" also assists in preserving continuity with tradition, a second important principle. By restricting itself to

⁶⁵ See Potter, *The Paradoxical Preservation of a Principle*, 13 VILL. L. REV. 784, 791 (1968):

What type of questions are entailed in the debate concerning when a comatose patient should be declared dead? Medical questions and answers are only one element of the decisionmaking process. Medical skill may be used to establish that a patient has now entered and is likely to remain in a certain condition. But medical personnel along with the other members of the community must then ask: "What are we to do with patients in this condition?" The answer to that question does not flow directly from any medical knowledge. It is a question of social policy which must be decided by the entire community. Implementation of the communal policy may be left in the hands of physicians, but they act as agents of the communal conscience.

See generally Note, *Death with Dignity: A Recommendation for Statutory Change*, 22 U. FLA. L. REV. 368 (1970); Fletcher, *Legal Aspects of the Decision Not to Prolong Life*, 203 J.A.M.A. 65 (1968); Sharpe & Hargest, *Lifesaving Treatment for Unwilling Patients*, 36 FORDHAM L. REV. 695 (1968); Note, *The Dying Patient: A Qualified Right to Refuse Medical Treatment*, 7 J. FAM. L. 644 (1967); Elkinton, *The Dying Patient, The Doctor and the Law*, 13 VILL. L. REV. 740 (1968); Biörck, *supra* note 15, at 488-90.

⁶⁶ The ease with which the two questions can become confused is demonstrated by the following "general definition of human death" proposed in Halley & Harvey, *Medical vs. Legal Definitions of Death*, 204 J.A.M.A. 423, 425 (1968):

Death is irreversible cessation of all of the following: (1) total cerebral function, (2) spontaneous function of the respiratory system, and (3) spontaneous function of the circulatory system.

Special circumstances may, however, justify the pronouncement of death when consultation consistent with established professional standards have been obtained and when valid consent to withhold or stop resuscitative measures has been given by the appropriate relative or legal guardian.

The authors seem to have realized the mistake in making the state of being dead (rather than the acceptance of imminent death) depend on the "consent" of a relative or guardian, and this aspect of the "definition of death" is absent from their subsequent writings. See, e.g., Halley & Harvey, *Law-Medicine Comment: The Definitional Dilemma of Death*, 37 J. KAN. B. ASS'N 179, 185 (1968); cf. D. MEYERS, *supra* note 28, at 135-36 (criticizing Halley and Harvey's second definition for its internal inconsistency).

the "is he dead?" issue, a revised "definition" permits practices to move incrementally, not by replacing traditional cardiopulmonary standards for the determination of death but rather by supplementing them. These standards are, after all, still adequate in the majority of cases, and are the ones that both physicians and the public are in the habit of employing and relying on. The supplementary standards are needed primarily for those cases in which artificial means of support of comatose patients render the traditional standards unreliable.

Third, this incremental approach is useful for the additional and perhaps most central reason that any new means for judging death should be seen as just that and nothing more—a change in method dictated by advances in medical practice, but not an alteration of the meaning of "life" and "death." By indicating that the various standards for measuring death relate to a single phenomenon legislation can serve to reduce a primary source of public uneasiness on this subject.⁶⁷ Once it has been established that certain consequences—for example, burial, autopsy, transfer of property to the heirs, and so forth—follow from a determination of death, definite problems would arise if there were a number of "definitions" according to which some people could be said to be "more dead" than others.

There are, of course, many instances in which the law has established differing definitions of a term, each framed to serve a particular purpose. One wonders, however, whether it does not appear somewhat foolish for the law to offer a number of arbitrary definitions of a natural phenomenon such as death. Nevertheless, legislators might seek to identify a series of points during the process of dying, each of which might be labelled "death" for certain purposes. Yet so far as we know, no arguments have been presented for special purpose standards except in the area of organ transplantation. Such a separate "definition of death," aimed at increasing the supply of viable organs, would permit physicians to declare a patient dead before his condition met the generally applicable standards for determining death if his organs are of potential use in transplantation. The adoption of a special standard risks abuse and confusion, however. The status of prospective organ donor is an arbitrary one to which a person can be assigned by relatives⁶⁸ or physicians and is unrelated to anything about the extent to which his body's functioning has deteriorated. A special "definition" of death for transplantation purposes would thus need

⁶⁷ See notes 15, 16 *supra*. The way in which cardiopulmonary and brain functions relate to each other and to the phenomenon of death is explored in note 89 *infra*.

⁶⁸ UNIFORM ANATOMICAL GIFT ACT § 2(c). For example, if a special standard were adopted for determining death in potential organ donors, relatives of a dying patient with limited financial means might feel substantial pressure to give permission for his organs to be removed in order to bring to a speedier end the care given the patient.

to be surrounded by a set of procedural safeguards that would govern not only the method by which a person is to be declared dead but also those by which he is to be classified as an organ donor.⁶⁹ Even more troublesome is the confusion over the meaning of death that would probably be engendered by multiple "definitions."⁷⁰ Consequently, it would be highly desirable if a statute on death could avoid the problems with a special "definition." Should the statute happen to facilitate organ transplantation, either by making more organs available or by making prospective donors and transplant surgeons more secure in knowing what the law would permit, so much the better.⁷¹

If, however, more organs are needed for transplantation than can be legally obtained, the question whether the benefits conferred by transplantation justify the risks associated with a broader "definition" of death should be addressed directly⁷² rather than by attempting to subsume it under the question "what is death?" Such a direct con-

⁶⁹ The Uniform Anatomical Gift Act, which establishes procedures for the donation of organs by an individual or his relatives, appears to operate on the premise that "death" will be determined by standards which are generally accepted and applied in the ordinary course of events; it does not undertake to "define" death. *But cf.* note 100 *infra*.

⁷⁰ For instance, suppose that Mr. Smith, a dying patient in University Hospital, is found to be immunologically well matched with Mr. Jones, a University Hospital patient awaiting a heart transplant. Under the special transplantation "definition" Smith is then declared dead, but just as the surgeons are about to remove Smith's heart, Jones suddenly dies. The doctors then decide that Smith is no longer needed as an organ donor. His condition does not meet the standards for declaring death in non-donors. Is Smith "dead" or "alive"?

⁷¹ This would be the case if the generally applicable standards for determining death permit organs to be removed at a time when they are still useable for transplantation purposes. The "definition" suggested by the Article meets this objective, we believe.

⁷² Much of the public's fear of premature excision arises from the failure to distinguish the general practitioner's and the transplant surgeon's meaning of the term 'death'. It would be desirable to distinguish the two formally, and use different terms.

Hillman & Aldridge, *Towards a Legal Definition of Death*, 116 SOL. J. 323, 324 (1972) [hereinafter cited as Hillman]. These British medical-legal commentators suggest that "irreversible brain damage," which would include patients with no higher brain activity but continued spontaneous respiration, be recognized as a ground for removal of organs prior to ordinary death. They contemplate that certain "essential safeguards" be incorporated into a statute on "irreversible brain damage" to avoid abuse of this category. *Id.* 325.

Prior to the first heart transplant in France, a special "definition" was enacted to remove any uncertainty about the permissibility of removing a beating heart from a "dead" donor. In April 1968 the government decreed a "definition of clinical death" for use with organ donors, based on a flat electroencephalogram of ten minutes duration which was taken to show that an artificially maintained patient lacks "function in the higher nervous centers." D. MEYERS, *supra* note 28, at 113. Meyers seems to question this approach; he believes that the public must be shown

not just that the brain has been irreparably damaged, but also that the extent of this damage is absolutely inconsistent with continued maintenance of independent life in the individual. If electro-enphalograph testing can in fact show this, then it is a valuable definitional tool in ascertaining clinical death; but the medical profession as yet appears somewhat divided on its reliability. In such circumstances, the public cannot be expected to accept the evidence of an electro-enphalographic reading as part of a legislative definition of death.

Id. 135.

frontation with the issue could lead to a discussion about the standards and procedures under which organs might be taken from persons near death, or even those still quite alive, at their own option⁷³ or that of relatives, physicians, or representatives of the state. The major advantage of keeping the issues separate is not, of course, that this will facilitate transplantation, but that it will remove a present source of concern: it is unsettling to contemplate that as you lie slowly dying physicians are free to use a more "lenient" standard to declare you dead if they want to remove your organs for transplantation into other patients.

Fourth, the standards for determining death ought not only to relate to a single phenomenon but should also be applied uniformly to all persons. A person's wealth or his "social utility" as an organ donor should not affect the way in which the moment of his death is determined.

Finally, while there is a need for uniformity of application at any one time, the fact that changes in medical technology brought about the present need for "redefinition" argues that the new formulation should be flexible. As suggested in the previous section, such flexibility is most easily accomplished if the new "definition" confines itself to the general standards by which death is to be determined and leaves to the continuing exercise of judgment by physicians the establishment and application of appropriate criteria and specific tests for determining that the standards have been met.

VI. THE KANSAS STATUTE

The first attempt at a legislative resolution of the problems discussed here was made in 1970 when the State of Kansas adopted "An Act relating to and defining death."⁷⁴ The Kansas statute has

⁷³ See, e.g., Blachly, *Can Organ Transplantation Provide an Altruistic-Expiatory Alternative to Suicide?*, 1 LIFE-THREATENING BEHAVIOR 6 (1971); Scribner, *Ethical Problems of Using Artificial Organs to Sustain Human Life*, 10 TRANS. AM. SOC. ARTIF. INTERNAL ORGANS 209, 211 (1964) (advocating legal guidelines to permit voluntary euthanasia for purpose of donating organs for transplantation).

⁷⁴ Law of Mar. 17, 1970, ch. 378, [1970] Kan. Laws 994 (codified at KAN. STAT. ANN. § 77-202 (Supp. 1971)). It provides in full:

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

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 aforesaid brain

received a good deal of attention; similar legislation was enacted in the spring of 1972 in Maryland and is presently under consideration in a number of other jurisdictions.⁷⁵ The Kansas legislation, which was drafted in response to developments in organ transplantation and medical support of dying patients, provides "alternative definitions of death,"⁷⁶ set forth in two paragraphs. Under the first, a person is considered "medically and legally dead" if a physician determines "there is the absence of spontaneous respiratory and cardiac function and . . . attempts at resuscitation are considered hopeless."⁷⁷ In the second "definition," death turns on the absence of spontaneous brain function if during "reasonable attempts" either to "maintain or restore spontaneous circulatory or respiratory function," it appears that "further attempts at resuscitation or supportive maintenance will not succeed."⁷⁸ The purpose of the latter "definition" is made clear by the final sentence of the second paragraph:

Death is to be pronounced before artificial means of supporting respiratory and circulatory function are terminated and *before any vital organ is removed for the purpose of transplantation.*⁷⁹

The primary fault with this legislation is that it appears to be based on, or at least gives voice to, the misconception that there are two separate phenomena of death. This dichotomy is particularly unfortunate because it seems to have been inspired by a desire to establish a special definition for organ transplantation, a definition which physicians would not, however, have to apply, in the drafts-

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.

These alternative definitions of death are to be utilized for all purposes in this state, including the trials of civil and criminal cases, any laws to the contrary notwithstanding.

⁷⁵ See note 4 *supra*. In the Maryland law, which is nearly identical to its Kansas progenitor, the phrase "in the opinion of a physician" was deleted from the first paragraph, and the phrase "and because of a known disease or condition" was added to the second paragraph following "ordinary standards of medical practice." MARYLAND SESSIONS LAWS ch. 693 (1972). Interestingly, Kansas and Maryland were also among the first states to adopt the Uniform Anatomical Gift Act in 1968, even prior to its official revision and approval by the National Conference of Commissioners on Uniform State Laws.

⁷⁶ Note 74 *supra*.

⁷⁷ *Id.* In using the term "hopeless," the Kansas legislature apparently intended to indicate that the "absence of spontaneous respiratory and cardiac function" must be irreversible before death is pronounced. In addition to being rather roundabout, this formulation is also confusing in that it might be taken to address the "when to allow to die?" question as well as the "is he dead?" question. See note 85 *infra* & accompanying text.

⁷⁸ Note 74 *supra*.

⁷⁹ *Id.* (emphasis added).

man's words, "to prove the irrelevant deaths of most persons."⁸⁰ Although there is nothing in the Act itself to indicate that physicians will be less concerned with safeguarding the health of potential organ donors, the purposes for which the Act was passed are not hard to decipher, and they do little to inspire the average patient with confidence that his welfare (including his not being prematurely declared dead) is of as great concern to medicine and the State of Kansas as is the facilitation of organ transplantation.⁸¹ As Professor Kennedy cogently observes, "public disquiet [over transplantation] is in no way allayed by the existence in legislative form of what appear to be alternative definitions of death."⁸² One hopes that the form the statute takes does not reflect a conclusion on the part of the Kansas legislature that death occurs at two distinct points during the process of dying.⁸³ Yet this inference can be derived from the Act, leaving open the prospect "that X at a certain stage in the process of dying can be pronounced dead, whereas Y, having arrived at the same point, is not said to be dead."⁸⁴

The Kansas statute appears also to have attempted more than the "definition" of death, or rather, to have tried to resolve related questions by erroneously treating them as matters of "definition." One supporter of the statute praises it, we think mistakenly, for this reason: "Intentionally, the statute extends to these questions: When can a physician avoid attempting resuscitation? When can he terminate resuscitative efforts? When can he discontinue artificial main-

⁸⁰ Taylor, *supra* note 5, at 296.

⁸¹ Cf. Kass, *A Caveat on Transplants*, The Washington Post, Jan. 14, 1968, § B, at 1, col. 1; Discussion of Murray, *Organ Transplantation: The Practical Possibilities*, in MEDICAL PROGRESS, *supra* note 1, at 67 (comments of Dr. T. E. Starzl): "[T]he new risk is introduced [by the use of cadaver organs] that the terminal care of such potential donors may be adversely influenced by the events which are expected to follow after death, which might conceivably remove whatever small chance there might have been for survival."

⁸² Kennedy, *supra* note 20, at 947.

⁸³ General use of the term "resuscitation" might suggest the existence of a common notion that a person can die once, be revived (given life again), and then die again at a later time—in other words, that death can occur at two or more distinct points in time. But resuscitation only restores life "from *apparent* death or unconsciousness." WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY 1937 (1966) (emphasis added). The proposed statute, text accompanying note 88 *infra*, takes account of the possibility of resuscitation by providing that death occurs only when there has been an *irreversible* cessation of the relevant vital bodily functions. Cf. 3 M. HOUTS & I.H. HAUT, COURTROOM MEDICINE § 1.01 (3)(d) (1971):

The ability to resuscitate patients after apparent death, coupled with observations that in many cases the restoration was not to a state of consciousness, understanding and intellectual functioning, but merely to a decerebrate, vegetative existence, and with advances in neurology that have brought greater, though far from complete, understanding of the functions of the nervous system, has drawn attention to the role of the nervous system in maintaining life.

⁸⁴ Kennedy, *supra* note 20, at 948.

tenance?"⁸⁵ To be sure, "when the patient is dead" is one obvious answer to these questions, but by no means the only one. As indicated above, we believe that the question "when is the patient dead?" needs to be distinguished and treated separately from the questions "when may the doctor turn off the respirator?" or "when may a patient—dying yet still alive—be allowed to die?"

VII. A STATUTORY PROPOSAL

As an alternative to the Kansas statute we propose the following:

A person will be considered dead if in the announced opinion of a physician, based on ordinary standards of medical practice, he has experienced an irreversible cessation of spontaneous respiratory and circulatory functions. 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, he has experienced an irreversible cessation of spontaneous brain functions. Death will have occurred at the time when the relevant functions ceased.

This proposed statute provides a "definition" of death confined to the level of *general physiological standards*, and it has been drafted in accord with the five principles set forth above in section V. First, the proposal speaks in terms of the *death* of a *person*. The determination that a person has died is to be based on an evaluation of certain vital bodily functions, the permanent absence of which indicates that he is no longer a living human being. By concentrating on the death of a human being as a whole, the statute rightly disregards the fact that some cells or organs may continue to "live" after this point,⁸⁶ just as others may have ceased functioning long before the determination of death. This statute would leave for resolution by other means the question of when the absence or deterioration of certain capacities, such as the ability to communicate, or functions, such as the cerebral, indicates that a person may or should be allowed to die without further medical intervention.

Second, the proposed legislation is predicated upon the single phenomenon of death. Moreover, it applies uniformly to all persons,⁸⁷

⁸⁵ Mills, *The Kansas Death Statute: Bold and Innovative*, 285 NEW ENG. J. MED. 968 (1971).

⁸⁶ Cf. F. MOORE, TRANSPLANT 27-36 (1972).

⁸⁷ Differences in the exact mode of diagnosing death will naturally occur as a result of differing circumstances under which the physician's examination is made. Thus, the techniques employed with an automobile accident victim lying on the roadside at

by specifying the circumstances under which each of the standards is to be used rather than leaving this to the unguided discretion of physicians. Unlike the Kansas law, the model statute does not leave to arbitrary decision a choice between two apparently equal yet different "alternative definitions of death."⁸⁸ Rather, its second standard is applicable only when "artificial means of support preclude" use of the first. It does not establish a separate kind of death, called "brain death." In other words, the proposed law would provide two standards gauged by different functions, for measuring different manifestations of the same phenomenon. If cardiac and pulmonary 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.⁸⁹ Some people might prefer a single standard, one based either on cardiopulmonary or brain functions. This would have the advantage of removing the last trace of the "two

night may be less sophisticated than those used with a patient who has been receiving treatment in a well-equipped hospital.

⁸⁸ KAN. STAT. ANN. § 77-202 (Supp. 1971).

⁸⁹ [L]ife is supported by the smooth and integrated function of three principal systems: circulatory, respiratory and nervous So long as the integrated function of these three systems continues, the individual lives. If any one of them ceases to function, failure of the other two will shortly follow, and the organism dies. In any case it is *anoxia*, or deprivation of oxygen, that is the ultimate cause of death of cells: in central nervous system failure, because the impulses which maintain respiration cease; in cardiac failure, because oxygenated blood is not moved to the cells; and in respiratory failure, because the blood, although circulating, is not releasing carbon dioxide nor replenishing oxygen in the lungs. Although other organs, such as the liver and kidneys, perform functions essential to life, their failure does not *per se* result in immediate death; it results, rather, in the eventual failure of one of the three systems described, and is thus only an indirect cause of death.

3 M. HOUTS & I.H. HAUT, COURTROOM MEDICINE § 1.01(2)(a) (1971).

It has long been known that, even when a patient loses consciousness and becomes areflexive, he may recover if heartbeat and breathing continue, but if they do not there is no hope of recovery. Thus, death came to be equated with the absence of these two "vital signs," although what was being detected was really the permanent cessation of the integrated functioning of the circulatory, respiratory, and nervous systems. In recent years, the traditional concept of death has been departed from, or at least severely strained, in the case of persons who were dead according to the rationale underlying the traditional standards in that they had experienced a period of anoxia long enough to destroy their brain functions, but in whom respiration and circulation were artificially re-created. By recognizing that such artificial means of support may preclude reliance on the traditional standards of circulation and respiration, the statute proposed here merely permits the logic behind the long-existing understanding (*i.e.*, integrated trisystemic functioning) to be served; it does not create any "new" type of death. Practically, of course, it accomplishes this end by articulating the "new" standard of "irreversible cessation of spontaneous brain functions," as another means of measuring the existing understanding. Dr. Jean Hamburger has observed, "After the guillotine has cut off a criminal's head, it is possible now to keep the heart and lungs going on for days. Do you think that such a person is dead or alive?" *Discussion of Louisell, Transplantation: Existing Legal Constraints*, in MEDICAL PROGRESS, *supra* note 1, at 100. The purpose of the "new" standard is to make it clear that the answer to Hamburger's question is unequivocally that the person is dead. *Cf.* Gray v. Sawyer, 247 S.W.2d 496 (Ky. 1952) (newly discovered evidence that blood was gushing from decedent's decapitated body is significant proof that she was still alive following an accident); Biörck, *supra* note 15, at 485; Note, *supra* note 1, at 206.

deaths" image, which any reference to alternative standards may still leave. Respiratory and circulatory indicators, once the only touchstone, are no longer adequate in some situations. It would be possible, however, to adopt the alternative, namely that death is *always* to be established by assessing spontaneous brain functions. Reliance only on brain activity, however, would represent a sharp and unnecessary break with tradition. Departing from continuity with tradition is not only theoretically unfortunate in that it violates another principle of good legislation suggested previously, but also practically very difficult, since most physicians customarily employ cardiopulmonary tests for death and would be slow to change, especially when the old tests are easier to perform,⁹⁰ more accessible and acceptable to the lay public, and perfectly adequate for determining death in most instances.

Finally, by adopting standards for death in terms of the cessation of certain vital bodily functions but not in terms of the specific criteria or tests by which these functions are to be measured, the statute does not prevent physicians from adapting their procedures to changes in medical technology.⁹¹

A basic substantive issue remains: what are the merits of the proposed standards? For ordinary situations, the appropriateness of the traditional standard, "an irreversible cessation of spontaneous respiratory and circulatory functions,"⁹² does not require elaboration. Indeed, examination by a physician may be more a formal than a real requirement in determining that most people have died. In addition

⁹⁰ The clinical signs of irreversible loss of brain functions are probably not a great deal more difficult to elicit than the traditional signs of death are to detect, although the former are less accessible since they require active intervention to be eluded and are not susceptible of mere observation. Aside from the taking of an electroencephalogram, the tests involved (such as tickling the cornea, irrigating the ear with ice water, and tapping the tendons with a reflex hammer) are fairly simple, but unlike the customary tests (such as listening for heartbeat with a stethoscope, seeing if a mirror held by the nose and mouth is clouded by breathing, and measuring pulse), they require equipment which a physician may be less likely to have at hand.

⁹¹ For example, it remains to be determined whether an electroencephalographic reading is necessary for an accurate diagnosis, as many now hold, or whether it should be regarded as having only "confirmatory value," as urged by the Harvard Committee. See note 11 *supra*.

⁹² This language, taken from the proposed statute, is intended as a succinct summary of the standard now employed in ordinary circumstances. Of course, the requirement that the cessation of these functions be *irreversible* cannot be emphasized too strongly. A physician may be needed to make this determination in some cases—and to apply the means necessary to reverse a temporary cessation caused by a heart attack or the like. But laymen are also aware of the significance of the requirement as is indicated by the common practice of giving "first aid," in the form of artificial respiration, to restore breathing in victims of mishaps, particularly drowning, electric shock, and poisoning.

Two British commentators suggest that legislation "defining" death also prescribe the resuscitative efforts required to be made before death may be declared. Hillman, *supra* note 72, at 325. We believe it is enough to demand "irreversibility," as a consequence of which whatever attempts at resuscitation are established by current standards of good medical practice would be compelled.

to any obvious injuries, elementary signs of death such as absence of heartbeat and breathing, cold skin, fixed pupils, and so forth, are usually sufficient to indicate even to a layman that the accident victim, the elderly person who passes away quietly in the night, or the patient stricken with a sudden infarct has died.⁹³ The difficulties arise when modern medicine intervenes to sustain a patient's respiration and circulation. As we noted in discussing the Harvard Committee's conclusions, the indicators of brain damage appear reliable, in that studies have shown that patients who fit the Harvard criteria have suffered such extensive damage that they do not recover.⁹⁴ Of course, the task of the neurosurgeon or physician is simplified in the common case where an accident victim has suffered such gross, apparent injuries to the head that it is not necessary to apply the Harvard criteria in order to establish cessation of brain functioning.

The statutory standard, "irreversible cessation of spontaneous brain functions," is intended to encompass both higher brain activities and those of the brainstem. There must, of course, also be no spontaneous respiration; the second standard is applied only when breathing is being artificially maintained. The major emphasis placed on brain functioning, although generally consistent with the common view of what makes man distinctive as a living creature, brings to the fore a basic issue: What aspects of brain function should be decisive? The question has been reframed by some clinicians in light of their experience with patients who have undergone what they term "neocortical death" (that is, complete destruction of higher brain capacity, demonstrated by a flat E.E.G.). "Once neocortical death has been unequivocally established and the possibility of any recovery of consciousness and intellectual activity [is] thereby excluded, . . . al-

⁹³ The statute provides that the determination of death depends on "the announced opinion of a physician." This raises two distinct sorts of questions. First, which physician's opinion is decisive? As previously observed, text accompanying note 64 *supra*, under "ordinary standards of medical practice" the physician declaring death would be the patient's own attending physician; this is particularly true of a patient who is receiving cardiopulmonary support in a hospital. Since, however, circumstances such as an automobile accident may arise in which death will have to be determined by a physician who had not previously attended the decedent, it was thought best to cast the language in terms of "a physician."

Second, questions may arise concerning the determination of death by nonphysicians. In an emergency, laymen may sometimes have to decide whether death has occurred, and to act on that determination, as in deciding whether to attempt to rescue someone who may or may not have already died. The proposed statute does nothing to change that practice or to alter any liability that might result under such circumstances, but merely specifies that an official determination must rest on "the opinion of a physician." This is consistent with existing state laws on the procedures by which death is "certified." These provisions, as well as ordinary medical practices, make it unnecessary to spell out in the model statute the exact manner in which the physician's opinion should be recorded or certified in the medical files or official documents.

⁹⁴ See note 12 *supra* & accompanying text.

though [the] patient breathes spontaneously, is he or she alive?"⁹⁵ While patients with irreversible brain damage from cardiac arrest seldom survive more than a few days, cases have recently been reported of survival for up to two and one-quarter years.⁹⁶ Nevertheless, though existence in this state falls far short of a full human life, the very fact of spontaneous respiration, as well as coordinated movements and reflex activities at the brainstem and spinal cord levels, would exclude these patients from the scope of the statutory standards.⁹⁷ The condition of "neocortical death" may well be a proper justification for interrupting all forms of treatment and allowing these patients to die, but this moral and legal problem cannot and should not be settled by "defining" these people "dead."

The legislation suggested here departs from the Kansas statute in its basic approach to the problem of "defining" death: the proposed statute does not set about to establish a special category of "brain death" to be used by transplanters. Further, there are a number of particular points of difference between them. For example, the proposed statute does not speak of persons being "medically and legally dead," thus avoiding redundancy and, more importantly, the mistaken implication that the "medical" and "legal" definitions could differ.⁹⁸

⁹⁵ Brierley, Adams, Graham & Simpsons, *Neocortical Death After Cardiac Arrest*, 2 LANCET 560, 565 (1971) [hereinafter cited as Brierley]. In addition to a flat (isoelectric) electroencephalogram, a "neuropathological examination of a biopsy specimen . . . from the posterior half of a cerebral hemisphere" provides further confirmation. *Id.* The editors of a leading medical journal question "whether a state of cortical death can be diagnosed clinically." Editorial, *Death of a Human Being*, 2 LANCET 590 (1971). Cf. note 14 *supra*.

⁹⁶ Brierley and his colleagues report two cases of their own in which the patients each survived in a comatose condition for five months after suffering cardiac arrest before dying of pulmonary complications. They also mention two unreported cases of a Doctor Lewis, in one of which the patient survived for 2¼ years. Brierley, *supra* note 95, at 565.

⁹⁷ The exclusion of patients without neocortical function from the category of death may appear somewhat arbitrary in light of our disinclination to engage in a philosophical discussion of the basic concepts of human "life" and "death." See text accompanying notes 57-60 *supra*. Were the "definition" contained in the proposed statute a departure from what has traditionally been meant by "death," such a conceptual discussion would clearly be in order. But, as this Article has tried to demonstrate, our intention has been more modest: to provide a clear restatement of the traditional understanding in terms which are useful in light of modern medical capabilities and practices. See note 89 *supra*.

A philosophical examination of the essential attributes of being "human" might lead one to conclude that persons who, for example, lack the mental capacity to communicate in any meaningful way, should be regarded as "not human" or "dead." It would nevertheless probably be necessary and prudent to treat the determination of that kind of "death" under special procedures until such time as medicine is able routinely to diagnose the extent and irreversibility of the loss of the "central human capacities" (however defined) with the same degree of assurance now possible in determining that death has occurred. Consequently, even at the conceptual level, we are inclined to think that it is best to distinguish the question "is he dead?" from such questions as "should he be allowed to die?" and "should his death be actively promoted?"

⁹⁸ The use of the word "legally" (as in "a person will be considered legally dead") in a law defining death is redundant. Besides, if there were a distinction between a

Also, the proposed legislation does not include the provision that "death is to be pronounced before" the machine is turned off or any organs removed. Such a *modus operandi*, which was incorporated by Kansas from the Harvard Committee's report, may be advisable for physicians on public relations grounds, but it has no place in a statute "defining" death. The proposed statute already provides that "Death will have occurred at the time when the relevant functions ceased."⁹⁹ If supportive aids, or organs, are withdrawn after this time, such acts cannot be implicated as having caused death. The manner in which, or exact time at which, the physician should articulate his finding is a matter best left to the exigencies of the situation, to local medical customs or hospital rules, or to statutes on the procedures for certifying death or on transplantation if the latter is the procedure which raises the greatest concern of medical impropriety. The real safeguard against doctors killing patients is not to be found in a statute "defining" death. Rather, it inheres in physicians' ethical and religious beliefs, which are also embodied in the fundamental professional ethic of *primum non nocere* and are reinforced by homicide and "wrongful death" laws and the rules governing medical negligence applicable in license revocation proceedings or in private actions for damages.

The proposed statute shares with the Kansas legislation two features of which Professor Kennedy is critical. First, it does not require that two physicians participate in determining death, as recommended by most groups which set forth suggestions about transplantation. The reasons for the absence of such a provision should be obvious. Since the statute deals with death in general and not with death in relation to transplantation, there is no reason for it to establish a general rule which is required only in that unusual situation. If particular dangers lurk in the transplantation setting, they should be dealt with in legislation on that subject, such as the Uniform Anatomical

"medical" and a "legal" standard of death, a statute could only legislate the legal standard. Consequently, the adjectives "medical" and "legal" are unnecessary as well as potentially misleading. Cf. Halley & Harvey, *Medical vs. Legal Definition of Death*, 204 J.A.M.A. 423 (1968).

⁹⁹ It is necessary to state a standard for judging *when* death occurred for disputes, typically concerning inheritance or rights of survivorship, in which the exact time of death is a decisive factor. The proposed statute, in accordance with existing practice, see text accompanying note 62 *supra*, fixes the time of death as the point at which the person actually dies, not the point at which the diagnosis is confirmed. This approach conforms to the commonsense understanding that both a man who dies in a coal mine and cannot be found for 24 hours and one who dies in a hospital where the practice is to require confirmation of the diagnosis by repeating the tests after 24 hours have been dead for a day before their deaths can be pronounced with certainty. The statutory phrase "relevant functions" refers to whichever functions are being measured: cardio-pulmonary functions in the usual case, or brain functions where the others are obscured by the artificial means being employed.

Gift Act.¹⁰⁰ If all current means of determining "irreversible cessation of spontaneous brain functions" are inherently so questionable that they should be double-checked by a second (or third, fourth, etc.) physician to be trustworthy, or if a certain means of measuring brain function requires as a technical matter the cooperation of two, or twenty, physicians, then the participation of the requisite number of experts would be part of the "ordinary standards of medical practice" that circumscribe the proper, non-negligent use of such procedures. It would be unfortunate, however, to introduce such a requirement into legislation which sets forth the general standards for determining who is dead, especially when it is done in such a way as to differentiate between one standard and another.

Kennedy's second objection, that a death statute ought to provide "for the separation and insulation of the physician (or physicians) attending the patient donor and certifying death, from the recipient of any organ that may be salvaged from the cadaver," is likewise unnecessary.¹⁰¹ As was noted previously, language that relates only to transplantation has no place in a statute on the determination of death.

VIII. CONCLUSION

Changes in medical knowledge and procedures have created an apparent need for a clear and acceptable revision of the standards for determining that a person has died. Some commentators have argued that the formulation of such standards should be left to physicians. The reasons for rejecting this argument seem compelling: the "definition of death" is not merely a matter for technical expertise, the uncertainty of the present law is unhealthy for society and physicians alike, there is a great potential for mischief and harm through the possibility of conflict between the standards applied by some physicians and those assumed to be applicable by the community at

¹⁰⁰ In fact, § 7(b) of the Uniform Anatomical Gift Act calls only for one physician: "The time of death [of a donor] shall be determined by a physician who attends the donor at his death, or, if none, the physician who certifies the death."

In *Tucker v. Lower* (see notes 42-50 *supra* & accompanying text) the defendants argued that this provision amounted to a "definition" of death (death is when a physician says you're dead), although Virginia had not adopted the Act until 1970, two years after the transplantation of the plaintiff's brother's heart. The court rejected this argument since "neither the decedent nor anyone acting on his behalf had made a gift of any part of his body" and the Act was therefore inapplicable. The reasons for rejecting the defendant's suggestion seem to us to go deeper; they have been presented throughout this Article and are summarized in the concluding section.

¹⁰¹ Kennedy, *supra* note 20, at 949. Again, § 7(b) of the Uniform Anatomical Gift Act covers this point adequately: "The physician [who declares death] shall not participate in the procedures for removing or transplanting a part."

large and its legal system, and patients and their relatives are made uneasy by physicians apparently being free to shift around the meaning of death without any societal guidance. Accordingly, we conclude the public has a legitimate role to play in the formulation and adoption of such standards. This Article has proposed a model statute which bases a determination of death primarily on the traditional standard of final respiratory and circulatory cessation; where the artificial maintenance of these functions precludes the use of such a standard, the statute authorizes that death be determined on the basis of irreversible cessation of spontaneous brain functions. We believe the legislation proposed would dispel public confusion and concern and protect physicians and patients, while avoiding the creation of "two types of death," for which the statute on this subject first adopted in Kansas has been justly criticized. The proposal is offered not as the ultimate solution to the problem, but as a catalyst for what we hope will be a robust and well-informed public debate over a new "definition." Finally, the proposed statute leaves for future resolution the even more difficult problems concerning the conditions and procedures under which a decision may be reached to cease treating a terminal patient who does not meet the standards set forth in the statutory "definition of death."