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Integration and Death by the Brain Criterion

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In their article on death by the brain criterion, "Total Brain Death: Valid Criterion of Death" (*Bioethics Outlook*, September 2013), Germain Grisez and Patrick Lee appear to reject what is known as the irreversible *loss of integration* explanation that was adopted by Pope John Paul II in 2000[1] in favour of an irreversible *loss of sentience* view of death by the brain criterion.

In the article Lee and Grisez et al assert:

Since a human being is a rational animal, anything that entirely lacks the capacity for rational functioning is not a human being. Since rational functioning in an animal presupposes sentient functioning, anything that entirely lacks the capacity for sentient functioning also lacks the capacity for rational functioning and so is not a human being. Since the human being is a mammal, a brain, or the capacity to develop a brain, is necessary for its capacity for sentient functioning. Therefore, any entity that entirely lacks a brain and the capacity to develop a brain is not a human being.[2]

In this issue

Nicholas Tonti Filippini, Associate Dean of the John Paul II Institute for Marriage and Family in Melbourne, responds to the article by German Grisez and Patrick Lee on 'brain death' as a criterion of death which appeared in *Bioethics Outlook* in September last year. Since that article was itself a summary of the longer piece in *Bioethics*, Volume 26, No 5, 2012, Dr Tonti-Filippini refers also to that article.

[1] Address of John Paul II to the 18th International Congress of the Transplantation Society, Tuesday 29 August 2000,n.5www.vatican.va/holy_father/john_paul_ii/speeches/2000/jul-sep/documents/hf_jp-ii_spe_20000829_transplants_en.html

[2] Ibid. p. 277-8

Later they state their position very 0H1H2Hclearly:

Our position that the complete loss of specifically human capacities is the human being's passing away does not entail that everyone who is unconscious and will never regain consciousness is already dead. Many unconscious people who will never regain consciousness would regain it if they were given appropriate care. Our position only entails that the loss of the capacity for consciousness is death.[3]

In the next paragraph they wrote:

We think it is beyond reasonable doubt that brain-dead entities entirely lack the capacity for the sentient functioning that is presupposed by human consciousness, but it is not beyond reasonable doubt that individuals who are warm and pink and breathing but not totally brain dead lack that capacity.[4]

In the following paragraphs in both articles, Lee and Grisez addressed the difficulty of determining that a person has lost consciousness short of their being diagnosed as having experienced total brain death, but the basic point seemed to be that if irreversible loss of sentience could be established empirically than that would indicate death. Prior to these segments Grisez et al had critiqued the loss of integration view of death by the brain criterion based on Alan Shewmon's empirical claims that functions indicating integration continue after "brain death". In other words they reject the explanation of death by the brain criterion offered by Pope John Paul II. It should be noted that they differ from Shewmon who continues to accept the Traditional integration explanation. Unlike Lee and Grisez he argues empirically that brain death does not result in the loss of that integration and hence those patients should not be considered dead.

Lee and Grisez's explanation is troubling firstly because obviously it is a departure, at least in theory, from the position upheld in all Australian jurisdictions (and the US, Canada and New Zealand but not the UK) that death may be diagnosed by:

a) Irreversible loss of circulation;

b) Irreversible loss of all function of the brain.

Evidently a person can retain some functions of the brain but not be sentient nor be capable of recovering sentience. That is to say, Lee and Grisez's position is that a person who permanently lost the capacity for sentience is dead. That would imply that if there sufficient evidence of that permanent loss then a patient could be declared dead and their organs taken for transplantation, even though they retained some brain function.

This is a radical departure not only from the law, but also from the Catholic tradition which has insisted that a person whose brain still functions but who has permanently lost consciousness is severely disabled rather than dead and to be treated with the respect owed to the living.[5] Note that such a state would not preclude decisions to withhold treatments that were life sustaining, but which were considered to be overly burdensome. Thus one might, for instance, decide to withdraw a ventilator on those grounds. However, deciding to withdraw a life sustaining treatment is a very different decision from a decision to treat someone as already dead and a source of vital organs for transplant to others.

A criticism that can be made of Lee and Grisez's treatment of the issue is that they appear to make no attempt to consider the issue theologically and that may be the reason why they have departed from the Tradition. To some extent, Grisez's recent writing on ethics has reflected a view that he expressed in 2009 in an article entitled, "The True Ultimate End of Mankind : the Kingdom, not God Alone"[6]. That article represented a departure from the Tradition and that departure has significant normative implications. It means that Grisez appears not to apply the teaching in *Veritatis Splendor* that the object of the moral act must be capable of being oriented to God. In the case of this analysis of death by the brain criterion, which has been republished in abridged form in this Catholic journal, the authors make no attempt

[3] Ibid. p. 283
[4] Ibid.

[5] Address of John Paul II to the participants in the international congress on "life-sustaining treatments and vegetative state: scientific advances and ethical dilemmas", Saturday, 20 march 2004, http://www.vatican.va/holy_father/john_paul_ii/speeches/2004/march/documents/hf_jp-ii_spe_20040320_congress-fiamc_en.html

[6] Germain Grisez "The True Ultimate End of Mankind : the Kingdom, not God Alone". *Theological Studies* March 2008 Vol 69 No. 1, pp. 38-61

to define death in the context of the Traditional theological understanding that death happens when the soul is separated from the body, but they do have a discussion of the soul in the longer article.

Lee and Grisez discuss arguments that a person who has suffered loss of all brain function might still possess a human immortal soul while vital capacities are maintained, by attributing the latter capacities to the soul.[7] Lee and Grisez respond :

The soul is that by which the human being is able to do this or that, but the capacities are possessed by, or inhere in, the human being, not in his or her soul. Even in intellectual and volitional acts, it is John or Mary, not the soul, that understands or wills, even though the acts of understanding and of willing (we hold) are not performed with bodily organs. The capacity or power belongs to the whole agent, not to the soul. So, just as one does not retain a capacity to walk after one loses one's legs – the act and the capacity belong to the whole human agent – so one does not retain a capacity to sense or imagine after the death of the whole brain.[8]

They go on them to discuss the soul and life after death:

If, as we assume, a human being's soul continues to exist after he or she dies, that soul may engage in conscious acts without a brain. However, any conscious acts of a separated soul would not be acts of the bodily person, whose totally brain-dead living remains in no way participate in that act. And if the living remains themselves have a soul, then it is a vegetative soul, not a rational or animal soul.[9]

This brings them into an age old debate that there is, in effect, more than one death and the latter involved a progression:

- St. Augustine (influenced by Plato) thought that there were many souls for different functions of the body and that there were two deaths - of body and of person.
- St Thomas Aquinas (influenced by Aristotle) though that the human being had only one soul and therefore only one death.

[7] Lee and Grisez *(Op. Cit.) p. 282*
[8] Ibid.
[9] Ibid.

For Augustine, to be alive is to have a soul, and death involves a process leading to the absence of the soul.[10] For Augustine therefore, not only do human beings have souls, but so do plants and other animals.[11] Augustine's view is not unlike what one finds, for example, in Plato[12] or Aristotle[13] where different levels of soul are discussed in terms of ascending degrees of complexity in their capacities, e.g., souls capable only of reproduction and nutrition, or of sensation and locomotion as well, or finally, of rational thinking.

St Augustine taught that when 'the brain by which the body is governed fails', the soul separates from the body. *Thus, when the functions of the brain which are, so to speak, at the service of the soul, cease completely because of some defect or perturbation – since the messengers of the sensations and the agents of movement no longer act –, it is as if the soul was no longer present and was not [in the body], and it has gone away'.*[14]

What Augustine seems to have meant is that the person as we know him has died when the functions of the brain *that are at the service of the soul* cease completely. That is to say, he thought that bodily life may continue even though the soul has departed. The departure of the immortal soul is what the Church then and now understands to be the death of the person even though he or she will be resurrected. Death of the person, of course, does not mean death of the immortal soul, but its separation from the body.

The significance of Augustine's position is that while the Church now believes that death is a single event that happens when the soul leaves the body and that this is characterized by the complete loss of integration of the body, Augustine adopted a view that when the parts of the body that maintain thought and memory no longer function, the soul has departed and therefore death of the person may in effect precede death of the body. This is what is referred to in modern terms as the "two deaths view" and seems to be in accordance with the Lee and Grisez view.

[10] Stanford Encyclopaedia of Philosophy, Accessed from: http://plato.stanford.edu/entries/augustine/#3
[11] St. Augustine *De Libero Arbitrio* I.8; *De Quantitate Animae*, 70; ; *De Civitate Dei* V.10
[12] Plato *Timaeus* 89d-92c
[13] *De Anima* 414b-415a
[14] St Augustine (*De Gen. ad lit.*, L. VII, chap. 19; PL 34, 365).

Augustine's two deaths view is different from St Thomas's notion of the soul and body which has been Church teaching since the Council of Vienne, namely, that it is the soul that forms or informs the body. On this view, Pope John Paul II asserted in 2000 that death is a singular event, not two events, and occurs when there is complete loss of integration. This happens when all parts of the brain have died. The contemporary view of the Church is that the departure of the soul is the death of the body and that what remains possesses only the non-integrated life of the individual organs, rather than the life of the body as an integrated whole. By contrast, Augustine acknowledged that departure of the soul could happen even though the body continued to function and to live, the loss of soul being reflected in the loss of capacity for thought and memory, not the loss of life of the body.

It is entirely consistent with the way in which the Church describes death to consider death to refer to the end of earthly life but not the end of the immortal soul. Thus at 1016 the Catechism states:

By death the soul is separated from the body, but in the resurrection God will give incorruptible life to our body, transformed by the reunion with our soul. Just as Christ is risen and lives forever, so all of us will rise at the last day.

It is a mystery to us what happens between death and resurrection. It is not at all clear that human beings experience life for a time as a soul only. There is no contradiction in referring to the death of the person when the human immortal soul no longer forms and informs the body and believing in resurrection of the body as the reuniting of an immortal soul with the body.

Death is the Separation of the Soul

In the article, Lee and Grisez acknowledge that they have based their position on the criticism that Dr Alan Shewmon has made of the *loss of integration* view of death. In his criticism of the view of death by the brain criterion explained by Pope John Paul II in 2000, Dr Alan Shewmon credits those who hold an integration view with what he calls

….the orthodox "whole brain" criterion which is based on the dual conceptual-physiological grounds that (1) death is a cessation of integrative unity of an organism, and (2) for humans, and higher animals, the brain is the master organ that integrates all the parts of the body."[15]

This representation of what Shewmon calls the orthodox "whole brain" criterion confuses necessary and sufficient conditions. If I were to say that the circulation of the blood is necessary for the human body to still be alive, no-one would hold that I therefore held that the heart was the master organ that integrates all the parts of the human body. To say that a function of an organ is necessary for there to be a living body is not to say that that organ is the master organ.

There is a variety of organs that are needed to sustain life in a body. For diagnostic purposes, medical practice has focused on two particular functions as being vital, that is necessary, for the life of the individual human body to continue, the heart or the brain.

The Pontifical Academy for Science addressed the issue of doubts about death by the brain criterion in 2006. The Academy argued for the following conclusions:

- There is not more than one form of death.
- So-called "brain death" means the irreversible cessation of all the vital activity of the brain (the cerebral hemispheres and the brain stem). This involves an irreversible loss of function of the brain cells and their total, or near total, destruction. The brain is dead and the functioning of the other organs is maintained directly and indirectly by artificial means.
- Loss of all brain function is death because it is associated with loss of integration of the body as a single whole.
- Death by the brain criterion can only be diagnosed with certainty if there is evidence that there is no blood supply to the brain, and that the "established clinical criteria" was in most circumstances a reliable indicator for the loss of all brain function.[16]

To say that loss of brain function *is associated* with loss of integration of the body as a single whole is not to say that brain function alone causes integration of the body, only that it may be a

[15] Shewmon, D. Alan "Ýou Only Die Once: Why Brain Death is Not the Death of a Human Being: A Reply to Nicholas Tonti-Filippini" *Communio* Vol 39 No. 3 Fall 2012 pp. 422-494

[16] Pontifical Academy of Sciences *Why the Concept of Brain Death is Valid as a Definition of Death: Statement by Neurologists and Others Vatican* 2006 http://www.vatican.va/roman_curia/pontifical_academies/acdscien/2008/excerpt_signs_of_death.pdf

necessary element. A model house built from a pack of playing cards has a form and structure as a card house until one of the bottom cards is removed when the whole structure collapses. That does not make the removed card the master card. It is one of many cards that could have been removed so that the structure lost its form.

The statement by the Academy that there is not more than one form of death is important. Theologically death is understood as the separation of the soul and this view has both a traditional and a scriptural basis reflected in the proclamation of the doctrine on the soul and the body at the Council of Vienne. Because of the advent of technology such as ventilators and drugs known as inotropes, it appears that some semblance of life can be maintained even if the essential dynamic unity that we know as bodily life has been lost following separation of the soul.

The inclusion, by the Academy, of evidence of a lack of blood supply to achieve certainty indicates a significant difference between the medical cultural context in which Shewmon operates and the dominantly European cultural context of the Academy, and that may explain some of Shewmon's difficulties with the Academy and their rejection of his evidence. Shewmon made claims about functions, such as homeostasis, continuing after death has been diagnosed by the brain criterion that would not have accorded with evidence of irreversible loss of ***all*** brain function, but might have been consistent with death by the brain criterion in the context of the lesser standards applying in the US and known as the *Mode of Being* view. More about this later.

Use of the phrase "brain death" is unfortunate because it implies that there are different forms of death. In our tradition, since the doctrine was defined by the Council of Vienne[17], we have understood that the soul is what gives form to, and informs, the matter in the unity that is our human body:

Adhering firmly to the foundation of the catholic faith, other than which, as the Apostle testifies, no one can lay, we openly profess with holy mother church that the only begotten Son of God, subsisting eternally together with the Father in everything in which God the Father exists, assumed in time in the womb of a virgin the parts of our nature united together, from which he himself true God became true man: namely the human, passible body and the intellectual or rational soul truly of itself and essentially informing the body...

...we reject as erroneous and contrary to the truth of the catholic faith every doctrine or proposition rashly asserting that the substance of the rational or intellectual soul is not of itself and essentially the form of the human body, or casting doubt on this matter.[18]

In accordance with this doctrine, Pope John Paul II said,

"*The death of a human being consists in the total disintegration of the unitary and integrated whole that is the personal self. Although death is an event which cannot be directly identified, biological signs or 'clinical markers' that inevitably follow can be recognised with increasing precision. These clinical markers indicate the irreversible loss of the integrated and coordinated life of the person as a single living organism."*[19]

It is important to note that the doctrine proclaimed by the Council refers to the soul as both *forming* and *informing* the unity that is the body. It is probable that the source for this aspect of the doctrine was St Thomas Aquinas.[20] However, the doctrine is also thought to have been implied by *Genesis* 2:7 "Then the LORD God formed man of dust from the ground, and breathed into his nostrils the breath of life; and man became a living being."

Defining Integration

We can take from the doctrine proclaimed at the Council of Vienne that the ongoing causative effect of the soul is its informing the body. Therefore the type of integration which is relevant is a communication of information to all parts of the body that keeps the body united and functioning as a single whole.[21]

This would seem to be consistent with Pope John Paul II's teaching that death is the separation of the soul from the body; that it consists in the total disintegration of the unitary and integrated whole

[17] Council of Vienne 1312. Accessed from: www.papalencyclicals.net/**Council**s/ecum15.htm

[18] Ibid.

[19] Address of John Paul II to the 18th International Congress of the Transplantation Society Tuesday 29 August 2000, n.5 www.vatican.va/holy_father/john_paul_ii/speeches/2000/jul-sep/documents/hf_jp-ii_spe_20000829_transplants_en.html

[20] Aristotle, *De Anima,* Bk. II, Ch. 1, 412b, 7.

[21] Nicholas Tonti-Filippini "You only die twice: St Augustine, St Aquinas and the Concept of Death by the Brain Criterion" *Communio* English Edition Fall 2011

that is the personal self; and that therefore what we are looking for is evidence or "clinical markers" that indicate the loss of the integrated and coordinated life of the person as a single living organism in which the soul forms and informs the matter to maintain the unity of the body. The relationship between soul and body is thus dynamic.

In defending Pope John Paul II's acceptance of determining death by the brain criterion, one need only accept that the loss of all brain function is a state of loss of dynamic unity of the body, not that the brain is the master organ, as Shewmon expresses it. As indicated above, the same claim can be made about loss of circulation. When the heart stops beating there is also a loss of integration, largely because vital organs such as the brain permanently cease to function soon after and the parts of the body have no means of communication if there is no circulation. The heart and the lungs perform an essential function in keeping the organs of the body alive, though the latter die at different rates when the heart stops beating.

The problem a faithful physician has in medically determining that death has occurred is that the soul is not observable. The doctrine, however, implies that the effects of the soul may be observable. When we observe the integrated functioning of the organic unity that is the human body, as a matter of faith we may be confident that that body is formed by a human soul, and therefore that the human soul must be present. Though there is no event that marks the separation of the soul at death, what the physician observes is the disintegration of the body that results from that separation. Loss of a communicative relationship between the parts of the dynamic unity that is the body would indicate loss of the dynamic role of the soul.

Pope John Paul II, expressed this in the following way:

… It is helpful to recall that the death of the person is a single event, consisting in the total disintegration of that unitary and integrated whole that is the personal self. It results from the separation of the life-principle (or soul) from the corporal reality of the person. The death of the person, understood in this primary sense, is an event which no scientific technique or empirical method can identify directly.

Yet human experience shows that once death occurs certain biological signs inevitably follow, which medicine has learnt to recognize with increasing precision. In this sense, the "criteria" for ascertaining death used by medicine today should not be understood as the technical-scientific determination of the exact moment of a person's death, but as a scientifically secure means of identifying the biological signs that a person has indeed died.[22]

Pope John Paul II did not proclaim doctrinally the diagnosis of death by the brain criterion. His words are more cautious. He gives permission for health practitioners to adopt the neurological criterion:

…the criterion adopted in more recent times for ascertaining the fact of death, namely the complete and irreversible cessation of all brain activity, if rigorously applied, does not seem to conflict with the essential elements of a sound anthropology. Therefore a health-worker professionally responsible for ascertaining death can use these criteria in each individual case as the basis for arriving at that degree of assurance in ethical judgement which moral teaching describes as "moral certainty". This moral certainty is considered the necessary and sufficient basis for an ethically correct course of action.[23]

It is, however, open to a faithful Catholic to challenge the medical empirical grounds on which the Pope based his judgement.

Nevertheless, one would reasonably expect that challenge to be based on accepting that the separation of the soul at death results in loss of integration and that the latter means a loss of dynamic unity in which not all the remaining parts of the body are unified through being interrelated to one another in a communicative sense (forming and informing). My concern with Shewmon's position[24], is not that he rejects Pope John Paul II's permission for health professionals to use the brain criterion to determine death - it is open to him to challenge the empirical grounds for that permission - but that he does not accept the notion of integration that the Pope engaged which implies dynamic unity of the organism that is the life of the person. Shewmon's notion of integration does not require that unity.

[22] Pope John Paul II, Op. Cit. n. 4
[23] Op. Cit. n.5 with
[24] Op. Cit.

Unlike Shewmon who rejects diagnosing death by the brain criterion at all, Grisez et al instead use Shewmon's concerns, about the brain criterion based on the latter's idea of integration, to argue for a much more liberal view, irreversible loss of sentience. Shewmon, of course, would not accept the latter as his concern is to restrict the diagnosis to loss of circulation only.

Shewmon's key point is that his notion of integration is more in line with reality. However his distinction between what he calls life-constituting and life-sustaining types of integration is problematic.

A difficulty with Alan Shewmon's treatment of integration is that he seems to considerate it sufficient that some parts of the body remain related to other parts of the body for the body to be considered integrated. This is not unity of the body in the sense implied by the doctrine proclaimed at Vienne, a unity that is a result of the soul *forming* and *informing* the matter.

For the purposes of understanding what integration must mean in the context of understanding the concept as a necessary element of being a living human person, his meaning will not do at all, because the concept must at least imply a dynamic intercommunicative unity between the parts. We take it that that dynamic unity, taking its form from the immortal soul, persists from the formation of the zygote until the soul separates from the body at death, even though in both *Donum Vitae* and *Dignitas Personae* the Congregation of the Faith is a little more circumspect about declaring that the zygote has a soul. It instead poses a question:

Certainly no experimental datum can be in itself sufficient to bring us to the recognition of a spiritual soul; nevertheless, the conclusions of science regarding the human embryo provide a valuable indication for discerning by the use of reason a personal presence at the moment of this first appearance of a human life: how could a human individual not be a human person?[25]

Shewmon devotes a great deal of space to his own theoretical analysis of integration, contrasting life-constituting and life-sustaining "types" as he expresses it and envisioning integration as being on two different axes.[26] The analysis is novel and interesting but ungrounded. There is no anthropological starting point and no apparent basis in existing philosophical or theological perspectives within the Tradition.

To try find an answer to this question of death that is consistent with our Tradition or, at least, a development of the Tradition, we do need to work from the point of view of trying to understand theologically what happens at death and what it is to understand what an individual life is from the single cell zygote until death: we need to develop an anthropology that makes sense of what it is to have an immortal rational soul that forms and informs the matter so as to be the unity that is a human person, as we understand the latter to be from the doctrine proclaimed at the Council of Vienne, and renewed many times since. At Vienne the doctrine was not presented as a philosophical thesis but instead offered a theological starting point by being based upon John's Gospel:

When Jesus had received the vinegar, he said, "It is finished"; and he bowed his head and gave up his spirit. Since it was the day of Preparation, in order to prevent the bodies from remaining on the cross on the sabbath (for that sabbath was a high day), the Jews asked Pilate that their legs might be broken, and that they might be taken away. So the soldiers came and broke the legs of the first, and of the other who had been crucified with him; but when they came to Jesus and saw that he was already dead, they did not break his legs. But one of the soldiers pierced his side with a spear, and at once there came out blood and water. He who saw it has borne witness--his testimony is true, and he knows that he tells the truth--that you also may believe.[27]

Linked to this Gospel account in our Tradition is the teaching that

Jesus "descended into the lower parts of the earth. He who descended is he who also ascended far above all the heavens." The Apostles' Creed confesses in the same article Christ's descent into hell and his Resurrection from the dead on the third day, because in his Passover it was precisely out of the depths of death that he made life spring forth.[28]

[25] Congregation for the Doctrine of the Faith *Donum Vitae* (1987) 5, I , 1
[26] Op. Cit.

[27] *John* 19:30-35
[28] *Catechism* n. 631. The doctrine from the Apostle's Creed on the descent into Hell, as a doctrine based in Scripture, is complex. The Scriptural basis for the doctrine includes: *Acts* 3:15; *Rom* 8:11; *1 Cor* 15:20; *Heb* 13:20; *1 Pet* 3:18-19; *Phil* 2:10; *Acts* 2:24; *Rev* 1:18; *Eph* 4:9; *Pss* 6:6; 88:11-13; 481 Cf. *Ps* 89:49; *1 Sam* 28:19; *Ezek* 32:17-32; *Lk* 16:22-26; *Mt* 27:52-53; *1 Pet* 4:6; *Jn* 5:25; cf. *Mt* 12:40; *Rom* 10:7; *Eph* 4:9. *Heb* 2:14-15;

In summary, the Catechism expresses the teaching in the following words:

In his human soul united to his divine person, the dead Christ went down to the realm of the dead. He opened heaven's gates for the just who had gone before him.[29]

Also in developing this anthropological understanding, we would need to include the *imago dei*[30] and the significance of being a person in the image of the Persons of the Blessed Trinity, again from the time we are a zygote until death, and then in the continuity of being a body after resurrection.

Shewmon, and Lee and Grisez following him, make no apparent attempt to link Shewmon's theories of integration to doctrine and Tradition or to any accepted philosophy.

Shewmon's account leads to an oddity in his discussion of the notion that a person might consist of a "brain in a vat". If this view is linked to his idea that the body could be considered to continue as a living person after the brain has died, then a person could be at the same time two persons – the isolated brain in a vat and the separated brainless body. There is something distinctly odd about a notion of integration that would allow for such a division which would contradict the essential unity of the human body. The possibility highlights the fact that Shewmon does not understand integration as implying the role of the soul in forming and informing the dynamic unity that is a human being.

I recall standing in an IVF clinic, a result of serving in a government role, and wondering about the precious content held within the tanks of liquid nitrogen. In the tanks there were literally hundreds of straws held in racks, each containing a human embryo, dried and frozen and held in a state of suspended animation. By the latter I mean that there was no growth and no biological activity of any kind. But as a matter of faith, I believed that each embryo instantiated a human soul and, because of that, each was the form and the reality of the adult he or she would become, if given the right environment in which he or she would be rehydrated and thawed and then transferred to a woman's uterus. Each of those straws contained such an extraordinary reality. Each was just a cluster of cells, but at the same time so much more than just cells, because those clusters of cells were human lives. They already contained the form of that person. As a cluster of cells they were linked together as a single entity already pre-programmed to develop in a predictable fashion, given the right conditions.

At another time I chaired a government committee[31] to develop ethical guidelines for the care of people in a post coma unresponsive state, (sometimes unfortunately referred to as a "persistent vegetative state" or PVS). It was brought home to me, by those caring for the patients I visited, that the unresponsiveness was just what *we* observed. What was happening within those individuals remained so much a mystery to us despite our brain scanning technologies. They had brain activity, but it was not connected to any observable expression of that activity. I also met some rare individuals who had survived several years in that state before recovering to a point that they could speak of their experiences.

I asked one young such man (he had been over two years without showing any responsiveness) who came to the launch of the ethical guidelines, what he remembered of his experience. He said he recalled conversations being held about whether to continue nutrition and hydration delivered through a PEG (percutaneous endoscopic gastrostomy). He said that he was also aware of the love of his parents, (his father, a general medical practitioner, and his mother, a nurse), and had confidence that they would protect him, as indeed they did.

There is, however, such a contrast between post-coma unresponsiveness which includes sleep-wake cycles, on the one hand, and, on the other, a person whose brain has completely died and the harsh reality of seeing the images of the latter's contrast angiogram showing no blood supply to the brain. In the latter case one knows that on autopsy the brain would be found to be a liquid without structure or life, and that it is only technology that sustains a semblance of the dynamic unity possessed by both the frozen-dried embryo and the person in an unresponsive state. In fact, no such unity exists once there is complete absence of brain function because the systems that communicate between organs, the neural and

Acts 3:15; and *Rev* 1:18. I am not a Scripture scholar and take what is in the Apostle's Creed as a matter of faith.

[29] *Catechism* n. 637

[30] *Genesis* 1

[31] Australian National Health and Medical Research Council, Working Committee to Develop Ethical Guidelines for the Care of People in a Post Coma Unresponsive State or Minimally Responsive State, 2007-2009.

endocrine systems, are missing a vital element. Circulation can be maintained, with assistance, but circulation without a brain is like a postal system without mail. Circulation is the means of communication, it is not in itself communication. The dynamic unity that is a personal life has been lost. Shewmon's insistence on circulation being a form of integration really misses the point that integration implies a dynamic intercommunicative unity. To be a unity in a meaningful sense the parts must be in actual communication with each other, not just be collocated with a system that could carry communications. The fact of the matter is that without the functions of the brain, the neural and endocrine systems have been profoundly interrupted. Circulation may be maintained, for a time, and thus the system for carrying communications, but the means of generating those communications is no longer present. There is thus no empirical evidence of the forming and informing that the doctrine refers to as the functions of the soul in the unity that is the life of the person.

Assessing the Significance of Remaining Activities

A difficulty that we have always had in understanding death of the human body is that, in most instances, some living activities persist within the body after death. Some of these can be dismissed as parasitic, such as the bacteria within the gut, though they ordinarily have important functions there. I have had personal experience of the harm that occurs if those bacteria are destroyed by strong anti-biotics. Some activities seem not to be significant, such as hair and fingernail growth. Surgeons can even remove a living sperm from a dead man, long after his heart and circulation has ceased, and use it reproductively so that he can father a child posthumously.

It is true that, after loss of all function of the brain in a body maintained to some extent on life support, there is certainly more activity occurring within that body than would occur in a body in which circulation had ceased. The issue is whether this activity is sufficient to provide evidence that the dynamic, intercommunicative unity of the body is maintained in those activities or whether the activities occur in relative isolation and not as a functional or dynamic unity.

As I have indicated, part of the difficulty in relation to the assumptions that Shewmon makes about continuing functions in a body in which all function of the brain has ceased, and consequently the position he has adopted rejecting the brain criterion, is that he is operating in an environment in which the *Mode of Being* view is dominant. The *Mode of Being* view was described by the recent US President's Council[32] as the contemporary basis for accepting death by the brain criterion. The *Mode of Being* view requires interaction with the environment. The Council rejected an integration view of death by the brain criterion and, more importantly, in doing so it set criteria for diagnosing death by the brain criterion that included only irreversible loss of spontaneous breathing and irreversible loss of consciousness, not loss of all brain function. In a way this was a recognition that US medical practice had moved away from what remains the legal definition of death in the US:

An individual who has sustained either (1) irreversible cessation of circulatory and respiratory functions, or (2) irreversible cessation of all functions of the entire brain, including the brain stem, is dead. A determination of death must be made in accordance with accepted medical standards.[33]

Unlike the US, the UK has actually changed its law to reflect what is now the US *Mode of Being* view. In 1995, the UK adopted irreversible loss of brain-stem function as the legal definition of death[34], thus better reflecting UK medical practice that had moved away from testing for irreversible loss of all brain function to testing for loss of brain stem function only.

Establishing irreversible loss of spontaneous breathing and of consciousness, which result from loss of brain-stem function, is a much lesser standard. The latter is certainly not what Pope John Paul II accepted when he explained that the neurological criteria for determining death "consists in establishing, according to clearly determined parameters commonly held by the international scientific community, the complete and irreversible cessation of all brain activity (in the cerebrum, cerebellum and brain stem)."

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[32] President's Council on Bioethics *Controversies in the Determination of Death: A White Paper* January 2009, Accessed December 2009 from http://bioethicsprint.bioethics.gov/reports/death/index.html.

[33] Uniform Determination of Death Act, Accessed 2/9/09 from http://www.law.upenn.edu/bll/archives/ulc/fnact99/1980s/udda80.htm

[34] "Criteria for the diagnosis of brain stem death" *Journal of the Royal College of Physicians,* London, 1995;29:381-2

What is referred to in actual medical practice as "brain death" in the United States and in most English-speaking countries, is now not loss of all function of the brain at all. Loss of consciousness and loss of spontaneous breathing may mean only that there is substantial damage to the brain stem.

There has been a significant change in the diagnosis of death by the brain criterion since I first began in this area, over 30 years ago. At that time, the clinical tests for brain-stem function were used at the end of a process to determine that the assessed damage to the higher parts of brain, usually as a result of brain swelling after trauma, had extended down to include the brain stem. In other words, swelling of the brain, in the rigid container that is the skull, caused loss of blood supply and thus destroyed not only the upper and mid-brain but also the brain stem. The clinical tests for some brain stem functions were thus only confirmatory and not, on their own, determinative.

In August 2012, at the launch of my book, *About Bioethics: Vol. III, Transplantation, Biobanks and the Human Body* (Connor Court, Ballan 2012) *,* the Vice Chancellor of Monash University, Professor Ed Byrne, a neurologist, supported this interpretation of the changes that had occurred since he and I worked together as fellow department heads at St. Vincent's Hospital, Melbourne, in the 1980s. At that time, after having death diagnosed by the brain criterion, it was understood that this was not a stable state and heart function would cease within 24 hours. That was such a contrast to what is now described as "brain death", with some pregnant women even surviving in that state long enough to give birth months later!

Unfortunately, the way in which the criteria may now be applied, it is not necessary to have established that all functions of the brain have ceased. It is possible and in fact not uncommon, that the current criteria being applied in English-speaking countries permit the diagnosis of death, according to the *Mode of Being* view, on the basis of damage to the brain stem alone, which would result in irreversible loss of consciousness and irreversible loss of spontaneous breathing, but not always loss of all brain function.

Alan Shewmon has reported a case in which homoeostasis was maintained in a patient TK who had been diagnosed according to the criteria applying in the US for diagnosing death.[35] The Pontifical Academy of Sciences did not accept Shewmon's claim in that respect[36], but it should be borne in mind that the panel was composed mostly of Europeans and the widely accepted European practice is not the *Mode of Being* view, but loss of function of all parts of the brain.[37] Homeostasis cannot be maintained in that state, which is partly why, thirty years ago, loss of circulation followed death by the brain criterion within 24 hours. The practices I have observed in Europe involve using ancillary testing to determine that there is no blood supply to the brain. That does establish with some certainty that there is loss of all brain function because warm brain tissue dies quite rapidly if deprived of oxygenated blood. Lee and Grisez have adopted Shewmon's view of function after death by the brain criterion, and Lee and Grisez's and Shewmon's context, presumably what they would understand is meant in US practice, is not what Pope John Paul II described as death by the neurological criteria. The latter clearly reflected a quite different practice from the current US practice, the so-called *Mode of Being* view or what, in the law of the UK, is now accepted as the death of the brain stem alone. We have the same problem in Australia and New Zealand with the leading authority, the Australia and New Zealand Intensive Care Society (ANZICS), describing the determination of death by the brain criterion as being diagnosable by the clinical tests for brain-stem function and at the same time admitting to continuing functions that are brain mediated functions.[38]

The ANZICS position is odd. On the one hand, the document states:

Brain death cannot be determined without evidence of sufficient intracranial pathology. Cases have been reported in which the brain-stem has been the primary site of injury and death of the brain-stem has occurred without death of the cerebral hemispheres (e.g. in patients with severe Guillain-Barré syndrome or isolated brain-stem injury). Thus brain death cannot be determined when the condition causing coma and loss of all brain-stem function has affected only the brain-

[35] Op. Cit.

[36] Battro A, Bernat M-G Bousser et al "Response to the Statements by Prof Spaemann and Dr Shewmon http//www.casinapioiv.va/content/academia/erv/publications/extraseries/braindeath.html Accessed March 2013

[37] Pontifical Academy of Sciences *Why the Concept of Brain Death is Valid as a Definition of Death: Statement by Neurologists and Others Vatican* 2006 http://www.vatican.va/roman_curia/pontifical_academies/acdscien/2008/excerpt_signs_of_death.pdf

[38] Australian and New Zealand Intensive Care Society (ANZICS) The Anzics Statement on Death and Organ Donation Edition 3.1 2010, p. 17

stem, and there is still blood flow to the supratentorial part of the brain. Whole brain death is required for the legal determination of death in Australia and New Zealand. This contrasts with the United Kingdom where brain-stem death (even in the presence of cerebral blood flow) is the standard.[39]

On the other the document allows for the diagnosis on the basis of the clinical tests without ancillary testing to rule out middle and upper brain function, and it affirms that the following activities may continue in someone diagnosed by the clinical criteria (brain-stem) alone:

- sweating, blushing, tachycardia;
- normal blood pressure without the need for pharmacological support; and
- absence of diabetes insipidus (DI) (preserved osmolar control mechanism).[40]

This is contradictory.

The difference in the US medical culture contributed to the problems that Shewmon had with the Pontifical Academy of Science. Clearly what death by the brain criterion means in the US, the UK, and other parts of the English-speaking world, is something much less, as described by the US President's Council in 2009 as the *Mode of Being* view, and identified by irreversible loss of consciousness and of spontaneous breathing only.

The Lee-Grisez-Shewmon position on the *loss of integration* view makes a number of medical claims that are at odds with an understanding of the state of medical knowledge on these matters. In relation to the latter, the functioning of the hormone system is controlled by the hypothalamic-pituitary axis in the brain. So, if the hypothalamic pituitary axis were to cease functioning, as happens if all function of the brain were to cease, then other hormonal glands would cease to receive the triggers that cause them to release hormones. For instance, if there was loss of all brain function, the insulin-producing islets would cease to produce insulin and *diabetes insipidus* would ensue. This is seen in about 50% of patients diagnosed by the brain criterion in Australia relying on the clinical (brain-stem only) tests, indicating that the other patients retain some functions of the brain, the mid-brain especially, and do not meet the criterion of loss of all brain function. When, with Professor Ed Byrne, I was first involved in this area in the 1980s, all patients who were diagnosed by the brain criterion had developed *diabetes insipidus.* Similarly, if there is loss of all function of the brain then functions mediated by the brain such as homeostasis could not continue. Homeostasis is defined as the condition of equilibrium (balance) in the body's internal environment due to the consistent interaction of the body's main regulatory processes and includes the regulation of heart rate, blood pressure, breathing rate, body temperature, and blood glucose levels. Those mechanisms depend on the functions of the hypothalamus and medulla within the brain.[41] Those functions could continue in a person who met the brain stem criterion for diagnosing death, but could not continue in someone who had lost all function of the brain. The anaesthetic text books and articles usually warn that there can be responses that are mediated by the brain such as sweating, blushing, increased heart rate and changes in blood pressure which might otherwise be assumed to be indicators of pain.[42]

A failing of Shewmon's critique is not to provide adequate acknowledgement of the problem that most English-speaking countries have departed from the loss of all brain function criterion, at least in practice, if not in law, by accepting the clinical (brain-stem) tests as sufficient to establish death without ancillary testing or other means of identifying the extent of the damage to the brain and thus being confident that all function of the brain has ceased.

The teaching of Pope John Paul II that permits diagnosis of death by the brain criterion is doctrinally sound and well-founded within our tradition. The medical facts of the matter, in relation to what counts as evidence, that the parts of what remains of the body are no longer the dynamically interrelated unity that is the personal self, are an empirical matter and open to developments in science. However, I can see no reason, on the basis of Lee and Grisez's arguments, based on Shewmon's empirical claims, to drop the *loss of integration* view held by Catholic Tradition.

[39] Ibid. p. 16
[40] Ibid. p. 17

[41] Tortora G. T, Derrickson B. H, 2009, *Principles of Anatomy and Physiology: Volume 1: Organisation, Support, Movement, and Control Systems of the Human Body,* 12th Ed, John Wiley and Sons, Pte. Ltd, Asia

[42] Gelb AW, Robertson KM "Anaesthetic management of the brain dead for organ donation" *Canadian J Anaesthetics* 1990 Oct Vol 37, No. 7, pp806-12.

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At the same time the US *Mode of Being* view adopted in many English-speaking countries, and the context for Shewmon's, and Lee and Grisez's commentary on the issue, is not acceptable.

As a matter of pastoral advice, it is important for a family to ask for evidence of death in the form of an image showing lack of blood supply to the brain, as is the practice in many countries including, France, Spain, Singapore and Japan. Having seen that evidence is a great help to families accepting the sudden death of a relative diagnosed by the brain criterion. That can be difficult when the patient appears to a lay person to be alive. The visible evidence that the brain is indeed dead is a great help for their grieving and their understanding. Catholic hospitals should require that there be evidence that all function of the brain has ceased.

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