

Of Wholes and Parts: A Thomistic Refutation of “Brain Death”

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ABSTRACT: I propose a refutation of the two major arguments that support the concept of “brain death” as an ontological equivalent to death of the human organism. I begin with a critique of the notion that a body part, such as the brain, could act as “integrator” of a whole body. I then proceed with a rebuttal of the argument that destruction of a body part essential for rational operations—such as the brain—necessarily entails that the remaining whole is indisposed to accrue a rational soul. Next, I point to the equivocal use of the terms “alive” or “living” as being at the root of conceptual errors about brain death. I appeal to the Thomistic definition of life and to the hylomorphic concept of “virtual presence” to clarify this confusion. Finally, I show how the Thomistic definition of life supports the traditional criterion for the determination of death.¹

THE CONCEPT OF “BRAIN DEATH” emerged in the late 1950’s when new technologies allowed physicians to maintain signs of life in bodies of patients who had sustained diffuse and irreversible brain injury. The medical and scientific community subsequently proposed neurological criteria to enable physicians to document the complete absence of brain function.² In turn, state and federal legislatures adopted such criteria to permit physicians to make a determination of death (so-called “brain death”³) that became legally equivalent to the traditional

¹ This article originally appeared in *The Linacre Quarterly* 82/3 (2015): 217-34 and is reprinted by permission of the author.

² *Ad Hoc* Committee of the Harvard Medical School to Examine the Definition of Brain Death, “A Definition of Irreversible Coma,” *Journal of the American Medical Association* 205/6 (1968): 337-40.

³ Throughout this article, “brain death” will refer to complete destruction of the brain or complete absence of brain function, and the “brain death concept” will refer to the ontological equivalence between “brain death” and

method of determining death based on the cessation of circulation and respiration.

A determination of death made on the basis of neurological criteria allows physicians to withdraw intensive care and ventilator support. The ensuing lack of spontaneous respiration is typically followed by cessation of circulation. Before discontinuation of treatment, however, surgical teams may harvest organs from the body for the purpose of transplantation or for biomedical research.

One of the most influential argument supporting the brain death concept rests on the premise that the brain is the “central integrator” of the body.⁴ Accordingly, irreversible cessation of brain function (usually accompanied by widespread destruction of brain tissue) indicates that the body is no longer an integrated organism but rather an assemblage of organs and cells that may, for a time, remain “alive” thanks to the intensive care given. The mechanical ventilator and other means of support “mask” the lack of integration and permit respiration, circulation, cellular metabolism, and organ function to continue for a short period until decomposition becomes more obviously manifest.

Beginning in the late 1980’s, however, reports of brain-dead bodies surviving for longer periods than initially expected began to surface. Such occurrences were most notably analyzed and published by Shewmon,⁵ who described manifestations of complex integrative function such as wound healing, pubertal changes, and even normal gestation. As a result, Shewmon withdrew his prior support for the concept of brain death, and his collected evidence became known as “Shewmon’s challenge.” As a result of Shewmon’s challenge, the “brain-as-integrator” premise lost some of its initial persuasiveness.⁶

“death” of the person. I will not, except in passing, refer to the concept of “neocortical death.”

⁴ For a historical review of the various premises for brain death, see D. Alan Shewmon, “Recovery from ‘Brain Death’: A Neurologist’s Apologia,” *Linacre Quarterly* 64/1 (1997): 30-96.

⁵ D. Alan Shewmon, “‘Brainstem Death,’ ‘Brain Death’ and Death: A Critical Re-evaluation of the Purported Equivalence,” *Issues in Law and Medicine* 14/2 (1998): 125-45.

⁶ See, for example, President’s Council on Bioethics, *Controversies in the Determination of Death* (Washington, D.C.: Government Printing Office, 2008).

More recently, another contention to support brain death has come into greater focus, particularly in Catholic bioethical circles, and is articulated as follows: when complete and irreversible absence of brain function is accompanied by on-going bodily integration, a human soul cannot be present because such a body lacks, in a radical way, the capacity for sentience and rational thought. The remaining body is a “non-human” organism. The “non-human” position has been articulated forcefully by Lee and Grisez,⁷ although others have also expressed similar viewpoints, for example, Ashley⁸ and Shewmon⁹ before his “conversion” from brain death.

In the first section of this article, I will show that the “brain-as-integrator” premise does not stand on sound philosophical footing and, in fact, is refuted by hylomorphic philosophy as well as by scientific principles. In the next section, I will argue that the “non-human” position reflects a misunderstanding of the hylomorphic principle of “disposition of matter,” and I will show that the proposal that a non-human soul animates brain-dead bodies is highly problematic. The third section of the article will point out that the equivocal use of the terms “alive” or “living” is the root of much confusion in the brain death debate. The confusion can be clarified by an appeal to the hylomorphic concept of “virtual presence.” Finally, I will show how the meaning of “life” according to Thomas Aquinas supports the traditional criterion for the determination of death.

Some commentators such as Eberl or Tonti-Filippini have questioned whether some of Shewmon’s cases represent factual, complete brain death. Because empirical findings are by nature provisional, a philosophical approach to the problem is all the more valuable. Jason T. Eberl, “Ontological Status of Whole-brain-dead Individuals” in *The Ethics of Organ Transplantation*, ed. Steven J. Jensen (Washington, D.C.: The Catholic Univ. of America Press, 2011), pp. 43-71. Nicholas Tonti-Filippini, “You Only Die Twice: Augustine, Aquinas, The Council of Vienne, and Death by the Brain Criterion.” *Communio: International Catholic Review* 38 (2011): 308-25.

⁷ Patrick Lee and Germain Grisez, “Total Brain Death: A Reply to Alan Shewmon,” *Bioethics* 26/5 (2012): 275-84.

⁸ Benedict Ashley, “Integrative Unity and the Human Soul,” *National Catholic Bioethics Quarterly* 1/1 (2001): 7-9.

⁹ D. Alan Shewmon, “The Metaphysics of Brain death, Persistent Vegetative State, and Dementia,” *The Thomist* 49/1 (1985): 24-80.

1. The “Brain-as-Integrator” Premise: Can a Part Integrate a Whole?

There are two salient features to the contention that brain death can be equated with death on the basis of the brain’s role as “integrator.” The first is the premise that the brain in fact fulfills this putative role of integration. The second is that the intensive care provided to the brain-dead body must be “masking” – at least for a time – the disintegration actually taking place. I will examine these two propositions in sequence, but first I will clarify the meaning of the terms “integration” or “integrative function” in the context of the determination of death.

The Meaning of Integration

Integration or integrative function can only refer simply and directly to the act, the cumulative functions, or processes by which an organism maintains itself as such. Integration is of the essence of a living substance. One does not speak of a living organism unless one refers to integrated parts. Conversely, if one speaks of functioning organs acting together, then one naturally is referring to an organism. If one should speak of different levels of integration within one organism (e.g., cellular, physical, metabolic), one must recognize that all these levels of functioning are subordinate to the integration of the whole being.¹⁰ I will discuss this point further in the third section of this article.

The proposition that irreversible cessation of brain function amounts to disintegration of the organism can therefore be restated more generally as a proposition that the brain is a *cause* of the organism, since, as mentioned above, integration is part of the definition of organism. “Cause” is here used in its strong, philosophical meaning that implies *dependence* of the effect on the cause. This meaning is

¹⁰ Much confusion can arise if one misses this point. For example, in a back-and-forth debate on brain death recently published in the journal *Communio*, Tonti-Filippini and Shewmon (2012) both appeal to a meaning of integration that could be interpreted as a form of substance pluralism, a charge that they end up ascribing to one another. Nicholas Tonti-Filippini, “Death by the Brain Criterion: A Response to Shewmon” on the website for *Communio: International Catholic Review* (March 24, 2013) at <http://www.communio-icr.com/articles/view/death-by-the-brain-criterion-a-response-to-shewmon>. D. Alan Shewmon, “You Only Die Once: Why Brain Death Is Not the Death of a Human Being,” *Communio: International Catholic Review* 39 (2012): 422-94.

distinguished from the “post-Humean” sense of cause otherwise commonly understood in science as *predictor* of an effect. The notion of dependence (as distinguished from prediction) is necessary if the task at hand is to determine *death as a state*, in contradistinction to the task of determining, for example, a “point of no return” in the dying process.¹¹ Determining death as a state remains the consensus goal around which the debate on brain death is taking place. In the context of organ transplantation, this consensus is at the basis of the so-called “dead donor rule.”

A living organism, then, is a body with integrated parts, and the “brain-as-integrator” premise relies on a presumed dependence of the organism on the brain. Indeed, the 1981 report by the President’s Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research (hereafter “President’s Commission”), which provided the basis for the legal establishment of neurological criteria for the determination of death, articulated this point in the following passages:

Since life is a matter of integrating the functioning of major organ systems, breathing and circulation are necessary but not sufficient to establish that an individual is alive. When an individual’s breathing and circulation lack neurologic integration, he or she is dead.

As the biomedical scientists who appeared before the Commission made clear, the traditional means of diagnosing death actually detected an irreversible cessation of integrated functioning among the interdependent bodily systems. When artificial means of support mask this loss of integration as measured by the old methods, brain-oriented criteria and tests provide a new window on the same phenomenon.

Only the brain can direct the entire organism. Artificial support for the

¹¹ Confusion also arises from the lack of distinction between these two senses of cause. For example, Bernat et al., while insisting that it is indeed the determination of death that is at stake, defend the brain death concept as one that should yield no “false positive” (i.e. life *depends* on the brain) yet they also defend the validity of the traditional criterion for death on the basis of its *prediction* of loss of integration of the organism (1981), p. 391. Dubois makes the same error when he asserts when the circulation-respiration criterion for death is fulfilled, “this state naturally *becomes* permanent within minutes” (2007), p. 556 (emphasis mine).

heart and lungs, which is required only when the brain can no longer control them, cannot maintain the usual synchronized integration of the body....

The centrality accorded the brain reflects both its overarching role as “regulator” or “integrator”¹² of other bodily systems and the immediate and devastating consequences of its loss for the organism as a whole.¹³

And prior to the convening of the President’s Commission, Grisez and Boyle had produced an influential publication in which they argued:

From a thermodynamic point of view an organism is an unstable open system, but it continues because it is maintained in dynamic equilibrium by homeostatic controls. These controls are of various kinds, but in an organism which is complex enough to have a nervous system, this system coordinates and integrates the other control systems. This system is dispersed but centered in the brain; without some brain functioning, the whole system cannot be maintained. Thus *when the whole brain ceases to function*, the dynamic equilibrium is lost, the materials which were unified in the system begin behaving without its control, and *decomposition begins*.¹⁴

To emphasize, the “brain-as-integrator” premise does not simply indicate that the brain is an essential or critical organ, for that characteristic is shared by many different parts of the body: the kidneys, liver, intestines, adrenal glands, etc. Absent any of these and the organism will die in due time. The premise stipulates that none of these organs have an integrative function in the way that its advocates attribute this function to the brain. Again, from the President’s Commission:

¹² Although “regulator” is occasionally used in addition to “integrator” and connotes differently from the latter, it is always used in conjunction with it. In this context, the two terms are intertwined: “rules” or “directions” cannot be given to a whole unless a whole exists in the first place; and the task of the integrator is essentially a regulatory one, demanding that each part “obey” the rule of unity.

¹³ President’s Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research, *Defining Death: Medical, Legal and Ethical Issues in the Determination of Death* (Washington, D.C.: Government Printing Office, 1981, pp. 33-35.

¹⁴ Germain G. Grisez and Joseph M. Boyle, *Life and Death with Liberty and Justice: A Contribution to the Euthanasia Debate* (Notre Dame IN: Univ. of Notre Dame Press, 1979), pp. 76-77 (my emphasis).

Other organ systems are also required for life to continue – for example, the skin to conserve fluid, the liver to detoxify the blood. The view that the brain's functions are more central to “life” than those of the skin, the liver, and so on, is admittedly arbitrary in the sense of representing a choice. The view is not, however, arbitrary in the sense of lacking reasons. As discussed previously, the centrality accorded the brain reflects both its overarching role as “regulator” or “integrator” of other bodily systems and the immediate and devastating consequences of its loss for the organism as a whole.¹⁵

And,

More importantly, this [brain death] concept would reduce the significance of continued respiration and heartbeat for the definition of death. This view holds that continued breathing and circulation are not in themselves tantamount to life.¹⁶

For the sake of accuracy, we should note that brain death advocates do not always or consistently attribute the role of integration exclusively to the brain, but sometimes point to the work of the brain in conjunction with the work of the lungs and heart, with the three organs operating under tight inter-connectedness.¹⁷ Nevertheless, the brain is viewed as prior to the lungs and heart in the hierarchy of integrative function. In the words of the President’s Commission report, the three organs constitute “a triangle of interrelated systems with the brain at its apex.”¹⁸

Can a Part Integrate a Whole?

To circumvent the complexity of ascribing to individual organs or systems their due proportion of integrative function, we may do well to broadly generalize the question and ask simply if it is possible for any material part to be the integrative cause of an organism. If the answer is negative, it will be so for the brain, the heart, the lungs, or any organ, combination of organs, or even elements under consideration. I will now consider the question according to hylomorphic and non-hylomorphic

¹⁵ President’s Commission, pp. 34-35.

¹⁶ President’s Commission, p. 33.

¹⁷ See James Dubois, “Avoiding Common Pitfalls in the Determination of Death.” *National Catholic Bioethics Quarterly*. 7/3 (2007): 545-59.

¹⁸ President’s Commission, p. 33.

philosophies.

From a Thomistic perspective, the answer to whether a part can be an integrative cause of an organism is a straightforward “no,” for this role is exclusively assumed by the substantial form of the body, i.e., the soul, as noted by Jones.¹⁹ A substance behaves in a unitary fashion precisely by virtue of having only one substantial form. A living body acts in a unitary and “integrated” fashion by virtue of the soul, which is the form of the body. In the words of Aquinas:

For it was shown that the soul as the form of the body is not united to the whole body through the medium of any of its parts, but is united directly to the whole body, because it is the form of the body as a whole and of each of its parts. And this must be maintained, for, since the body of a man or that of any other animal is a certain natural whole, it will be said to be one because it has one form whereby it is perfected, and not simply because it is an aggregate or a composition, as occurs in the case of a house and other things of this kind. Hence each part of a man and that of an animal must receive its act of existing and species from the soul as its proper form. Therefore the Philosopher says that when the soul leaves the body, neither the eye nor the flesh nor any part remains except in an equivocal sense.²⁰

The soul is clearly the cause of integration of the body, and to posit that a material part could be a necessary additional cause of integration presents an insurmountable problem, for in essence it would mean that the rest of the body is informed by that part in addition to the soul, which is incompatible with hylomorphic philosophy. The material part also cannot be a means by which the form integrates the body, since the act of integration is indistinguishable from the act of existence of the body. As Thomas puts it:

If, however, the soul is united to the body as its form, as we have said, it is impossible for it to be united by means of another body. The reason of this is that a thing is one, according as it is a being. Now the form, through itself,

¹⁹ David A. Jones, “Metaphysical Misgivings About ‘Brain Death’” in *Beyond Brain Death: The Case Against Brain Based Criteria for Human Death* (Dordrecht: Kluwer, 2000), pp. 91-119.

²⁰ Thomas Aquinas, *Questiones Disputatae de Anima*, §10, trans. John Patrick Rowan and html-ed. Joseph Kenny at <http://dhspriority.org/thomas/english/QDdeAnima.htm>,

makes a thing to be actual since it is itself essentially an act; nor does it give existence by means of something else. Wherefore the unity of a thing composed of matter and form, is by virtue of the form itself, which by reason of its very nature is united to matter as its act. Nor is there any other cause of union except the agent, which causes matter to be in act, as the Philosopher says.²¹

If, for the sake of completeness, we should consider more generally the different modes of causality through a Thomistic framework, it is clear that a part can neither be a material, nor an efficient, nor a final cause of a whole organism. These roles are fulfilled by prime matter, by extrinsic agents (the mother and father, via the sperm and egg), or by the good of the person, respectively.²² There is a sense in which a part can be a cause of the coming-to-be of the organism, namely, the sperm and egg as together “causing” the embryo. In this case, however, the parts meld into the organism and lose their distinction as parts. The only remaining possibility, then, is to consider whether the destruction of a part could be a necessary cause of the ceasing-to-be of the organism. This proposition is essentially the one supporting the “non-human” position that I will examine in the second section of this article.

Additionally, we should note that the integrity of the human body – or of any “mixed body” or “compound,” i.e., a body composed of more than one element – is also caused secondarily by the reciprocal action of all its constitutive elements, as elaborated by Aristotle:

All things which admit of combination must be capable of reciprocal contact: and the same is true of any two things, of which one acts and the other suffers action in the proper sense of the terms.²³

The point here is that the instrumental causality of material parts into an

²¹ Thomas Aquinas, *Summa Theologiae*, I, q.76, a.7. trans. Fathers of the English Dominican Province. <http://dhsprory.org/thomas/english/QddeVer.htm>.

²² Although one might say that, in a certain sense, “the whole acts for sake of the parts,” this “end” is shared among all the parts, and one would not say that the person acts for the sake of any part specifically.

²³ Aristotle, *De Generatione et Corruptione*, I.6.322b26-27. Aristotle, *De Generatione et Corruptione*, trans. Harold H. Joachim in *The Basic Works of Aristotle*, ed. Richard McKeon (New York NY: Random House, 1941).

integrated whole is shared reciprocally by all the elements in the body and is not, therefore, a causality that can be attributed preferentially to any one material element or part.

Let us now consider the question from alternative philosophical perspectives. The philosophy undergirding modern science, for one, cannot articulate with confidence its understanding of the concept of integrity in living organisms. Scientists do recognize the existence of organisms as intelligible entities and, in that sense, acknowledge that integration is an essential part of the concept of life. The material reductionism that forms the implicit philosophical basis of empirical science, however, cannot account for the integrity of the organism in any convincing way. Having discarded formal and final causality as explanatory principles of science, the reductionist approach can only appeal to material and efficient causes. These two principles have yet to provide a satisfying definition for the concept of life.²⁴

But setting aside modern science's inability to tackle the phenomenon of life, is it reasonable to postulate that a material part could fulfill a role of "central integrator" in a living organism? Not really, even if we think of integration under the most basic sense of physical "togetherness" of parts. First, any force applied by the integrating part to integrate the rest of the body necessitates, according to Newton's third law of motion, a reciprocal force of opposite direction and equal magnitude from the rest of the body to the integrator, rendering the distinction between integrator and integrated problematic. Second, the material part causing the integration would have to be directly controlling all other parts of the body to prevent them from being subject to forces of nature pulling them away from the body. A question would then arise: how does the integrator itself remain integrated? It cannot be its own cause of integration, since an external agent is necessary for efficient causality. Therefore another part would have to integrate the integrator, in which case this other part takes precedence as "central integrator," setting up an infinite regress.

²⁴ See, for example, the review by Gayon as well as the entire volume of its publication journal for an appreciation of the difficulties that vital integrity poses for modern science. Jean Gayon, "Defining Life: Synthesis and Conclusions," *Origins of Life and Evolution of Biospheres* 40/2 (2010): 231-44.

Empirical science may describe the physiologic phenomenon of integration by way of physiochemical laws, but it cannot explain its occurrence. Parts acting in conjunction with one-another by way of efficient causality to maintain a whole is a teleological process (parts acting *for the sake of the whole*). If empirical science limits itself to an approach based on material reductionism, it cannot even begin to deal with the question of a material part – the brain or any other – acting as a “central integrator.”

In response to the limitations of material reductionism, two other broad theories have appeared in recent decades to explain the wholeness of life.²⁵ So-called “emergence” theories postulate that new laws and principles emerge when simple systems increase in complexity. At a basic level, then, matter operates according to the reductionist laws. When entities become more complex and organized, new laws somehow emerge from the system to account for teleological causes and effects, such as integration. Emergence theory seems to be able to accommodate the phenomenon of integrity but in the final analysis does not offer a coherent account of it. It is unclear how the emergent laws can arise from more fundamental laws governing efficient causality in simpler systems. The “brain-as-integrator” premise, therefore, cannot confidently appeal to emergence theories for support.

The other approach might be to turn to a kind of “substance dualism” where an immaterial mind with power of efficient causality is proposed as the vital principle. This was essentially Descartes’s proposal four hundred years ago. As reviewed by Dodds, substance dualism was revived by modern scientist-philosophers such as John Eccles or Wilder Penfield. Within the framework of such a philosophy, a part of the body (the pineal gland, for Descartes, the whole brain for Eccles or Penfield) could act as mediator between mind and body. A major difficulty, however, lies in understanding the interaction between the immaterial soul and the material body (both complete substances in their own right), and how the efficient causality of the soul could take place in the world

²⁵ See, for example, Michael Dodds, “Hylomorphism and Human Wholeness: Perspectives on the Mind-Brain Problem,” *Theology and Science* 7/2 (2009):141- 62.

through the brain.²⁶

Finally, we should also acknowledge two other possible philosophical positions. First, an extreme reductionist philosophy may explicitly deny the organism as a substantial reality. Within the framework of this philosophy, living bodies are entirely accidental arrangements of matter. The change from life to death represents an accidental change. No special status is given to the integration of matter into an organized body, and therefore the problem of a part integrating a whole does not even arise. The separation between life and death is seen as purely arbitrary, and this lack of distinction is relied upon to propose the concept of “personal death” (i.e.. permanent unconsciousness) as a more meaningful determinant of death.²⁷

A second philosophical position would be one that considers a plurality of forms within a substance. Within such a philosophical framework, one could conceivably speak of different “levels” or “types” of integration, and a material part could conceivably be a cause of one of these levels of integrity. But as John Goyette has pointed out, form pluralism can be reduced to substance dualism and is confronted with similar serious, if not fatal, philosophical objections.²⁸

So, we have seen that the proposition that identifies the brain (or any part) as the central integrator of a body is rejected on the basis of hylomorphic theory, is highly problematic in the framework of modern science and “emergence theory,” and is irrelevant in the framework of strict materialism where all composite beings are accidental arrangements of elements. Substance dualism or pluralism could propose a corporeal part acting as integrator, but this proposal requires a leap of faith that few are willing to take.

²⁶ Per Eccles’s own admission: “Necessarily the Dualist-interactionist theory is in conflict with present natural law,” p. 21. John C. Eccles, “Consciousness, Self-Consciousness and the Brain-Mind Problem” in *The Human Psyche* (Heidelberg: Springer, 1980), pp. 1-26.

²⁷ See, for example, Jeff McMahan, “The Metaphysics of Brain Death,” *Bioethics* 9/2 (1995): 91-126.

²⁸ John Goyette, “St. Thomas on the Unity of Substantial Form,” *Nova et Vetera, English Ed.* 7/4 (2009): 781-90.

Can a Simple Cause “Mask” Disintegration?

Now the “brain-as-integrator” premise can also be rejected in another way, for even if we should overlook all the preceding philosophical objections, we would still fail to account for the phenomenon of the “brain-dead” body on a ventilator.

Let us bear in mind that the concept of brain death emerged because intensive care instruments, such as ventilators, allow signs of life to persist. The intensive care assumedly “masks” or “obscures” the underlying disintegration. Again, the President’s Commission articulates this point as follows:

As the biomedical scientists who appeared before the Commission made clear, the traditional means of diagnosing death actually detected an irreversible cessation of integrated functioning among the interdependent bodily systems. When artificial means of support mask this loss of integration as measured by the old methods, brain-oriented criteria and tests provide a new window on the same phenomenon.²⁹

Now that other traditional indicators of cessation of brain functions (i.e., absence of breathing), can be obscured by medical interventions, one needs, according to this view, new standards for determining death—that is, more reliable tests for the complete cessation of brain functions.³⁰

This assumption, however, contradicts the principle of proportionate causality: how could the ventilator with a simple power of insufflation, for example, account for the very complex effect of bodily integration -- a task precisely attributed to the remarkably complicated brain? The ventilator has no power to control homeostasis, circulation, digestion, growth, or any other such function. Could insufflation of air in-and-out of the chest by itself extend in time the myriad motions which must occur to keep the body integrated and working as a unitary whole?

The proponents argue that the ventilator provides sufficient gas exchange so that the motion of the heart and other physiologic processes can go on for a while, even though disintegration has otherwise effectively taken place. They point out that even when death is made by

²⁹ President’s Commission, p. 33.

³⁰ President’s Commission, p. 34.

the traditional cardiopulmonary criterion, signs of life and integration persist for a while: the body is still warm, minute contractions of the heart can be observed and, microscopically, cellular activity may be taking place. The ventilator simply extends the time in which this decaying process takes place.

This argument, however, is invalid even in the realm of scientific understanding. While it is true that signs of life may still be present immediately after a death as determined by the traditional cardiopulmonary criterion, the maintenance of integrative processes can be simply explained by inertia: the natural resistance to change that maintains the state of motion of bodies despite the opposing, disintegrative efficient causality of the outside environment.³¹ Inertia accounts for the continued integrity of the corpse with many of its *pre-mortem* features, and inertia may account for on-going but decaying minor cellular activity.³² Ventilated bodies, on the other hand, remain “integrated” for longer periods of time than can be accounted for by inertia alone. That is precisely how a “brain-dead” body is distinguished from a “simply dead” one in the first place. Any measurable extension of inertial movement requires a proportionate cause to produce the effect.

To better grasp the relevance of the principle of proportional causality, it may be helpful to think about a simpler situation. Let’s imagine a hand spinning a globe on its axis. When the hand is removed, inertia will account for the continued rotation of the globe until air resistance and friction on the axis bring the motion to a halt. Only a new tangential movement or new force applied in the same direction as the hand motion could make the globe turn for any longer period than accounted for by inertia. No other kind of force, no matter how vigorously applied, will

³¹ As an alternative to the concept of inertia developed by Newton, we can provide an explanation consonant with hylomorphic philosophy by appealing to the late-scholastic concept of “impetus,” reviewed by James A. Weisheipl, “Natural and Compulsory Movement” in *Nature and Motion in the Middle Ages*, ed. William E. Carroll (Washington, D.C.: The Catholic Univ. of America Press, 1985), pp. 25-48.

³² Another reason for on-going post-mortem cellular activity appeals to the hylomorphic concept of “virtual presence” as I explain in section 3 of this article.

produce the same effect. In fact, most forces applied will actually impede the inertial movement and cause the globe to stand still sooner rather than later. It is therefore unreasonable to expect that the work of the ventilator (even when combined with infusions of metabolically active substances) could extend the innumerable internal motions of life at a time when a state of disintegration is allegedly in effect.

In summary, then, the “brain-as-integrator” premise cannot be supported on philosophical grounds, except perhaps by adhering to substance dualism or pluralism. Furthermore, brain-dead bodies receiving intensive care can display integrative activity beyond what one would expect on the basis of inertia alone. This integrative activity has no explanation if one accepts the proposition that the brain is the integrating organ of the body, because only a cause proportionate to the power of the brain could maintain such integrative activity.

2. The “Non-Human” Position

We now turn to the argument that bodies surviving complete brain destruction are “non-human” organisms. The position has been advanced by Lee and Grisez as follows:

If an organism lacks the capacities for sentient functioning and the capacity to develop those capacities, it cannot be an animal (a sentient organism) and if an organism entirely lacks capacities for sentient functioning and is not an animal, it cannot engage in conceptual thought, reasoning, or deliberate choices and is not a rational animal.³³

Ashley argued similarly:

All our present biological data shows that the supreme organ of the body most directly in the service of intelligence and will is the brain. Therefore if this organ is destroyed so that it cannot function even minimally (and that is what Shewmon believes is true in the cases he cites), then the body no longer remains proportionate to the spiritual soul and death, that is, the separation of the spiritual soul from matter must take place. This is human death, even if some kind of residual life that is no longer human remains in the body.³⁴

³³ Lee and Grisez, p. 279.

³⁴ Ashley, p. 9.

In essence, this position proposes that the destruction of the brain is the cause of the ceasing-to-be of the human body, although not necessarily the cause of death of the body. As I did in the preceding section, I will refute the argument in a two-fold way. I will first show that the proponents of the “non-human” position misunderstand or misapply key hylomorphic principles about matter and form. I will then show that postulating the presence of a non-human soul in brain-dead bodies is highly problematic.

Does the Destruction of an “Essential” Part Imply the Ceasing-to-be of the Whole?

The “non-human” argument can be re-stated more generally as follows: the destruction of a part of the body (the brain) that is necessary for the essential operation (rational thought) of a given form (rational soul) implies that the body is no longer disposed for that particular form. A substantial change must have occurred, and what remains is a non-human, non-animal, vegetative, complex organism.

The proponents of the “non-human organism” seem to be appealing to the “disposition of matter” principle articulated by Aquinas as follows:

Furthermore, every substantial form requires a proper disposition in matter, without which it is not able to be; whence the way towards generation and corruption is alteration.³⁵

A form accrues to matter only when matter is properly disposed by fitting dispositions, and thus a form cannot remain in matter when the proper dispositions cease to exist. In this way, when the heat, natural humidity, and the like, are removed from the body, the union of soul and body is destroyed, because the body is disposed to receive the soul by means of these things. Hence things of this kind intervene as dispositions between the soul and the body.³⁶

Destruction of a part of a body is clearly an alteration. The brain being

³⁵ Thomas Aquinas, *De Mixtione Elementorum* 17-18, trans. Peter Orłowski and html-ed. Joseph Kenny available at <http://dhspriority.org/thomas/english/MixtioElementorum.htm>.

³⁶ Aquinas, *Quaestiones de Anima*, q. 9, ad 16.

so essential to sensitive and rational operations, it seems compelling to argue that destruction of the brain would render the body improperly disposed to the human form or soul.

To review, the idea that matter must be properly disposed to its substantial form is foundational to Thomistic philosophy. First of all, nature is well-ordered and behaves in certain ways that are manifest in the world and can accordingly be described by certain laws. Even though the universe undergoes incessant change, the change follows certain patterns that are intelligible to the mind. Furthermore, matter is a co-principle of substantial change, along with substantial form and privation. Matter has “a say in the matter” of substantial identity as the principle of potency: it is in matter that privation resides. Matter must be disposed to acquire the new form – i.e., it must have it – as an “ingredient” of the *terminus a quo*, the privation of the new form that will disappear in the *terminus ad quem*, when substantial change is completed.

That being said, we must not lose sight of the fact that substantial form is also co-principle by which the substance is “the kind of thing that it is.” Matter and form, then, jointly cause a substance to be and St. Thomas expresses the mutual dependence between matter and form as follows:

Also, we say that matter is the cause of the form, in so far as the form exists only in matter. Likewise, the form is the cause of the matter, in so far as matter has existence in act only through the form because matter and form are spoken of in relation to each other, as is said in the second book of the Physics. They are also spoken of in relation to the composite, as the part to the whole and as the simple to the composed.³⁷

Matter is prior to form from the point of view of generation and time because that to which something comes is prior to that which comes to it. But form is prior to matter from the point of view of substance and completeness, because matter has completed existence only through the form.³⁸

³⁷ Aquinas, *De Principiis Naturæ* §30, trans. R. A. Kocourek and html-ed. Joseph Kenny, available at <http://dhspriority.org/thomas/english/DePrincNaturae.htm>.

³⁸ Aquinas, *De Principiis Naturæ* §32.

Therefore, despite the mutual dependence between form and matter, substantial form, by virtue of being a principle of act, has “substantial and complete” ontological precedence over matter. Matter, on the other hand, existing only in potency, does not have any determining power *per se*, but only a “permissive” one.³⁹

Given matter’s existence in potency, hylomorphism prohibits the determination of substantial identity by means of empirical assessment of a given matter, because the matter in question is actualized by its present substantial form. In the context of brain death, the neurological criteria amount to empirical testing of a part, the brain. To say that the substantial form of the body is *necessarily* of a certain kind (“non-human”) *because* the part has a certain property (“radically incapacitated for sentient functioning and rational thought”) gives matter more power than hylomorphism allows it to have. It is the substantial form that is determining of substantial identity. The affirmation that the brain dead body is not informed by a rational soul because the brain is destroyed begs the question. That is actually the point in dispute.

A proper hylomorphic way to determine substantial identity must take into account the *whole* of a substance’s nature before making a judgment – its material ingredients, its behavior, how it comes to be, and how it corrupts. The correct hylomorphic maxim is “action follows being” – you know what a thing is by what it does. The proponents of the non-human position argue instead that “being follows being” – being dead follows being brainless. They effectively classify live “human-like” bodies by dichotomy on the basis of examination of a part: those with a non-functioning brain are declared “non-human” and those with some brain function are declared human. This approach to identifying and classifying living organisms was thoroughly rejected by Aristotle.⁴⁰

The philosophical error also amounts to a failure to consider the ontologic separation between what Aquinas called the “first act” of the

³⁹ For a more thorough explanation of this Thomistic doctrine in the context of a question raised by another biological debate, see David L. Schindler, “*Agere Sequitur Esse: What Does It Mean? A Reply to Father Austriaco*,” *Communio: International Catholic Review* 32 (2005): 795-824.

⁴⁰ Aristotle, *De Partibus Animalium* I.3, trans. William Ogle in *The Basic Works of Aristotle*, ed. Richard McKeon (New York NY: Random House, 1941).

soul, its act of giving existence to an integrated body, from the “second act” by which the body manifests its operation. Granted, the destruction of a part necessary for an essential power of a soul affects the exercise of that power. Hylomorphic philosophy, however, does not entail that the inability to exercise a power implies that the soul cannot perform its “first act” of causing the organism to exist. To insist that a body lacking a part necessary for the exercise of a given power implies that the present form of the body must be one that also lacks that power is untenable. By that account, any permanently or radically infertile organism (say, a mule, a neutered cat, or a bacterium in which the genes controlling cell division are deleted) should be considered “dead,” since reproductive power is an essential power of *any* soul.

The “non-human” proponents also fail to recognize that the behavior of the brain-dead body may precisely be in keeping with the nature of a human person. We expect a man or a woman who has sustained a severe and irreversible brain injury to be unresponsive, to lack brain activity on the electroencephalogram, to lack oculocephalic reflexes, etc. The neurologic tests reveal brain responses that are proportional to the extent of brain injury as would be expected *on the basis of human physiology*. The opposite behavior -- that of a body whose brain has been destroyed showing signs of cerebral activity -- would in fact be strong reason to suggest the presence of a very odd substantial identity!

Can Live “Human-like” Bodies Be “Non-Human”?

Let us now set aside the previous philosophical objections and grant that human bodies could corrupt to the point of substantial change, yet remain alive as non-human organisms. What could be said about the process of generation and corruption that has thus taken place, and of the soul informing such bodies?

The proposal entails that the living principle animating brain-dead bodies must be a vegetative soul. This conclusion, however, presents serious difficulties. To begin with, it is hard to imagine how the vegetative soul would have powers of operation to sustain an organism whose organs are clearly designed for the operations of an animal. For despite the fact that the brain is no longer functioning, brain-dead bodies still maintain homeostasis for the cardiovascular system, the

musculoskeletal system, the endocrine system, the renal system, etc., all of which are designed to support an animal substance. Even if the soul animating the brain-dead organism were merely vegetative in its operations, it would need to “know” the operations of an animal, particularly if one considers that wound healing, pubertal development, and gestation can all occur in brain-dead bodies, and all the more so if one considers that the so-called non-human organisms harbor organs composed of matter perfectly well-disposed for transplantation into humans.

Furthermore, the “non-human” proposal entails entirely novel ways of generation and corruption of complex organisms, heretofore unknown in any biological circumstance. Aquinas describes bodily corruption in the following passage.

Bodily corruption] comes about from the fact that, when the principle which holds the individual contrary parts together is removed, they tend to whatever agrees with them individually according to their own natures, and so the dissolution of the body takes place.⁴¹

The body on the ventilator, on the other hand, remains a complex organism with a nature overwhelmingly akin to that of a critically ill human being without the expected dissolution of the body. Similarly, the generation of a complex vegetative organism is normally by means of activation of a unicellular entity, the seed, and not, as postulated here, by means of corruption of a higher organism. These novelties render the “non-human” position all the more implausible.

Can parts live apart?

I will now point out the equivocal ways of speaking of “life” or of things “alive” and how this equivocation is source of great confusion in the brain death debate. Aquinas articulates the meaning of “life” as follows:

The name is given from a certain external appearance, namely, self-movement,

⁴¹ Aquinas, *Quaestiones Disputate de Veritate*, q.25, a. 6, trans. Robert W. Schmidt and html-ed. Joseph Kenny, available at <http://dhspriority.org/thomas/english/QDdeVer.htm>.

yet not precisely to signify this, but rather a substance to which self-movement and the application of itself to any kind of operation belong naturally. To live, accordingly, is nothing else than to exist in this or that nature.⁴²

Life, then, has two aspects: it is predicated of substances and it features self-movement. From this definition, it is clear that to say that an organ is maintained “alive” outside the body is a figure of speech since the isolated organ has no substantial unity.⁴³ Aristotle expresses the point as follows:

...if the eye were an animal, sight would have be its soul. For this is the substance, in the sense of the definable form, of the eye. The eye is the matter of sight, and apart from this it is eye no longer save equivocally, as with a painted or stone eye.⁴⁴

But it is precisely on the basis of this equivocation that Lee and Grisez defend their “non-human” position:

To explain the sort of entity that [the brain-dead body] is we begin by considering a single organ that is donated after someone has died. This entity – for example a donated lung – is a living, organized unit, and it is human in the sense that it comes from a human being and its cells have the human genome. But it is not part of the individual from which it came, and is not a member of the human species, or of any animal species.⁴⁵

They assert that because the donated lung is a “living, organized unit,” a collection of such organs put together would amount to a living, non-human organism.

Bodies, organs, cells, and the meaning of “life”

The error of Lee and Grisez comes from the fact that the donated lung has no substantial unity outside a body. The detached organ is obviously “disconnected” as can be seen from the hollow vascular

⁴² Aquinas, *Summa theologiae* I, q. 18, a.2.

⁴³ By the same token, it is also clear that characterizing a brain as “dead” is also equivocal. Only a substance can properly die, since only a substance can properly be said to be alive.

⁴⁴ Aristotle, *De Anima*, II.2, 412b.20.

⁴⁵ Lee and Grisez, pp. 281-82.

stumps that are emptied of their normal content of blood. This lung *in transit* is simply held together by inertia, and whatever life remains in the detached organ is the life of cellular substances, not the life of the organ itself. The detached lung has no “nature” *per se*; it does not breathe and there is no “lung soul” to speak of. The outcome of the thought experiment proposed by Lee and Grisez is impossible to conceive under the rules of natural philosophy.⁴⁶ And to be clear, such an experiment is not currently or remotely within scientific possibility.

Conversely, organs functioning in conjunction with one another necessarily point to the existence of a living organism. In speaking of a brain-dead body, some ethicists argue that organs working together do not point to the existence of a whole. Tonti-Filippini, for example, asserts “That there are functioning organs, or even some organs relating to or communicating with other organs, does not constitute an integrated unity of the whole body.”⁴⁷ Eberl holds a similar view, and they are both incorrect. Organ means instrument, which implies finality or end for the sake of which the organ functions. If these organs relate to or communicate with each other, the “collection” of organs must have a substantial unity. A similarly mistaken viewpoint was advanced by Bernat et al. In their influential 1981 article they stated: “A patient on a ventilator with a totally destroyed brain is merely a group of artificially maintained subsystems since the organism as a whole has ceased to function.”⁴⁸ The mention of “subsystems” invites the question: “sub-” to what? There is obviously a “whole” to which the subsystems pertain,

⁴⁶ Similar “fantastic” thought experiments widely (and wildly) inform the debate on brain death but are not exclusive to its proponents. Shewmon himself is also tempted by science fiction when he constructs a “brain in a vat” model and a “bisected person-organisms” to defend his position. See D. Alan Shewmon, “On Conscious Non-organisms, Unconscious Persons, and Bisected Person-Organisms,” *American Philosophical Association Newsletter* 9/1 (2009): 14-18. Unfortunately, Shewmon only adds confusion or fuel to the debate. See, for example, Tonti-Filippini’s reaction (2013).

⁴⁷ Nicholas Tonti-Filippini, “Bodily Integration: a Response to Spaemann,” *Communio: International Catholic Review* 39 (2012): 413-21 at p. 418.

⁴⁸ James L. Bernat, Charles M. Culver, and Bernard Gert, “On the Definition and Criterion of Death,” *Annals of Internal Medicine* 94/3 (1981): 389-94.

and that whole is the brain-dead body.

Organs working together form an organism. Organs apart from an organism cannot be said to be alive or to be organs, except equivocally. This situation does not hold, however, in the case of cells. Cells can and do live individually, apart from more complex organisms. Unicellular organisms, such as bacteria and amoebas, maintain an individual existence. Most multicellular organisms arise from the union or activation of prior unicellular substances. Individual cells can be harvested from multicellular organisms and be maintained as such perpetually if the proper medium is provided. The varied existence and behavior of cells was a fundamental discovery of modern science articulated in the mid-nineteenth century as the cell theory of life. The three tenets of the cell theory, valid to this day, are as follows: (1) All living organisms are composed of one or more cells; (2) the cell is the most basic unit of life; and 3) all cells come from pre-existing cells.

Cellular Substances and the Concept of “Virtual Presence”

The hylomorphic concept of “virtual presence” is the concept by which Aristotle and St. Thomas explain why so-called “mixed bodies,” that is, substances that come-to-be by combination of simpler elements manifest, in a certain way, the “natural powers” or properties of these constituent elements, even though the elements are now subject to the new form of the mixed body.⁴⁹ Water in a human body, for example, is informed by the human soul, yet it maintains, in some fashion, the natural power of “elemental” water. The concept of “virtual presence” of elemental forms is also important because it provides a basis for the notion of “disposition of matter” that we briefly touched upon earlier. The elements that constitute a mixed body retain – in a certain way – their natural powers, and therefore impose some constraints on the process of alteration that eventually leads to a substantial change. Additionally, as we saw in the previously cited passage from Aquinas,

⁴⁹ For a more complete discussion of the concept of “virtual presence,” see Christopher DeCaen, “Elemental Virtual Presence in St. Thomas,” *The Thomist* 64/2 (2000): 271-300, and Joseph Bobik, *Aquinas on Matter and Form and the Elements: A Translation and Interpretation of the de Principiis Naturæ and the De Mixtione Elementorum of St. Thomas Aquinas* (Notre Dame IN: Univ. of Notre Dame Press, 1998).

the elemental form of the constitutive ingredients may be recovered upon corruption of the body:

[Bodily corruption] comes about from the fact that, when the principle which holds the individual contrary parts together is removed, they tend to whatever agrees with them individually *according to their own natures*, and so the dissolution of the body takes place.⁵⁰

Biological observations and cell theory indicate that cellular substances behave in a way that satisfies the Thomistic concept of virtual presence. Unicellular entities have a substantial unity and therefore a singular soul. Gametes released by the parents are unicellular, vegetative substances. They are no longer part of the parent organism but manifest vegetative self-movement in the form of metabolism and – in the case of the sperm—locomotion. After the combination of gametes into the zygote, cellular structure and cellular metabolism are still observed. After growth of the organism, cells can be recovered from the body either at the time of corruption or through harvesting and placement in a proper culture medium. These cells are now actualized by the recovered vegetative soul previously “virtually present” in the organism. Furthermore, cells harvested *either before or after* death of the whole organism may be sufficiently disposed to being informed anew by another organism, namely, the transplant recipient.

Overlooking the concept of virtual presence can lead one to faulty conclusions about death as illustrated, for example by the following statement from Condic:

On a cellular and molecular level, nothing changes in the instant of death. Immediately following death, most of the cells in the body are still alive, and for a time at least, they continue to function normally.⁵¹

Inattentive to the distinct ontological status of cells before and after the death of the organism, Condic dismisses the signs of life evident in brain-dead bodies as being an unimportant factor to consider. In fact, a

⁵⁰ Aquinas, *Quaestiones disputate de Veritate*, q. 25, a.6 (emphasis mine).

⁵¹ Maureen Condic, “Life: Defining the Beginning by the End,” *First Things* 133 (2003): 50-54.

substantial distinction between the motion of cells in a body before and after death exists, in keeping with the change in substantial identity. Before death, the cells are informed, and therefore moved, by the soul of the organism. After death, the cells that remain alive may be living on the basis of their recovered vegetative soul.⁵² The persistence of cellular life, therefore, cannot be reason enough to ignore the significance of the vitality manifest in brain-dead bodies.

The Part that Keeps the Whole Alive

For final remarks, let us appreciate that Aquinas's succinct definition of life also shows that the traditional criterion for determining death is perfectly congruent with hylomorphic philosophy as compared to a neurological criterion.

As we saw in the first section of this article, no part of the body can claim the role of "integrator." That role cannot be ascribed to the heart or lungs any more so than to the brain. But hylomorphism does not exclude that a material part could be a primary organ of self-movement. The pulse and the breath are clinical indicators of self-movement, and if one wishes to focus on the triumvirate of brain, lung and heart, it is the latter, rather than the first two, which should be at the apex of the triangle responsible for the motion.⁵³ For the brain must sense a change in oxygen content or acidity of the blood before sending a nervous impulse to the lungs to activate a breath, and the lungs on their own have no power of motion. The heart, on the other hand, from around the sixth week of life onward, manifests an unrelenting and autonomous drive to contract. And the tendency for self-movement is evident even in the culture dish, where harvested cardiac cells can continue to inexorably "beat" to their own tune.

⁵² As discussed above, another explanation for residual cellular life after death of the organism could be "impetus" as the scholastic counterpart to inertia. The two may overlap, or may even represent the same phenomenon. A thorough understanding of impetus and of its relationship to the concept of virtual presence, however, is beyond the scope of this article.

⁵³ This fact eludes some proponents of brain death. Eberl (2011), for example, insists that even though St. Thomas had originally assigned the role of "primary organ" to the heart, he would have reassigned it to the brain had he been aware of the brain's role as "integrator" of the body.

It is therefore with great science that Aquinas correctly affirmed, centuries ago, that “the motion of the heart...is the principle of all movements in the animal.”⁵⁴ By this affirmation, we can rest assured that the traditional method of determining death is valid not because it signifies disintegration of the body, for after all, the corpse remain a single integrated unit, but because it signifies the absence of self-movement, a *sine qua non* of life.

Conclusion

We have seen that the proposition that a part can integrate a whole body is untenable on philosophical grounds, Thomistic or otherwise, and cannot serve as a premise to defend brain death. Furthermore, we have shown that hylomorphic philosophy cannot allow one to assert that the destruction of a part needed for the operation of an essential power of the soul implies that the body is informed by a soul with lesser power. Finally, we have shown that a Thomistic understanding of the meaning of “life” and the hylomorphic concept of “virtual presence” applied to cellular substances clarifies much of the confusion about death and can inform, to this day, appropriate criteria for its determination.

In conclusion, the major arguments supporting the concept of “brain death” as ontologically equivalent to death can be firmly rejected.

⁵⁴ Aquinas, *De Motu Cordis*.