



3º Congresso Aristotélico-Tomista de Psicologia * 18 a 31 de maio de 2025

Hylomorphism and Brain Death

Hilemorfismo e morte cerebral

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Abstract

Medical practitioners and philosophers both debate what the proper criterion for death is, that is, what empirical signs indicate that a human person ceases to be. This paper considers that debate in light of the Aristotelian-Thomistic or hylomorphic conception of the human person, the view on which we are composites of matter and intellectual soul. After presenting and defending the main ideas of this metaphysics, especially the claims that the soul is the form of an organism's matter, the telos of that matter, and the motor of the body, the paper develops a hylomorphic account of death as loss of functioning, organization, and teleology. It then considers issues of the unity and persistence of the soul, and the idea of the primary organ. The views of other hylomorphists on the brain death and circulatory-respiratory criteria for death are considered, along with the thought experiments often employed by philosophers to consider these criteria, especially Alan Shewmon's cerebrum transplant thought experiments. The paper ultimately contends that, on a hylomorphist view, the in normal situations the best criterion for death is the cessation of the capacity for circulation of oxygenated nutrient-bearing blood, not the cessation of functioning of the whole brain. The hylomorphist can also solve Shewmon's thought experiments, without treating a cerebrum transplant in the same way as a persistent vegetative state or the state of whole brain death, and without encountering the metaphysical problems into which other metaphysics of the human person fall.

Keywords

Hylomorphism, Thomistic Aristotelianism, brain death, criteria for death.

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Resumo

Médicos e filósofos debatem qual é o critério adequado para a morte, isto é, quais sinais empíricos indicam que uma pessoa humana deixa de existir. Este artigo considera esse debate à luz da concepção aristotélico-tomista ou hilemórfica da pessoa humana, a visão segundo a qual somos compostos de matéria e forma intelectual. Após apresentar e defender as principais ideias dessa metafísica, especialmente as afirmações de que a alma é a forma da matéria de um organismo vivo, o telos dessa matéria e o motor do corpo, o artigo desenvolve uma explicação hilemórfica da morte como perda de funcionamento, organização e teleologia. Em seguida, considera questões da unidade e persistência da alma e a ideia do órgão primário. As visões de outros hilemorfistas sobre a morte cerebral e os critérios circulatório-respiratórios para a morte são consideradas, juntamente com os experimentos mentais frequentemente empregados por filósofos para considerar esses critérios, especialmente os experimentos mentais de transplante de cérebro de Alan Shewmon. O artigo, em última análise, afirma que, na visão hilemorfista, em situações normais o melhor critério para a morte é a cessação da capacidade de circulação do sangue oxigenado e rico em nutrientes, não a cessação do funcionamento de todo o cérebro. O hilemorfista também pode resolver os experimentos mentais de Shewmon sem tratar um transplante cerebral da mesma forma que um estado vegetativo persistente ou o estado de morte cerebral total, e sem encontrar os problemas metafísicos nos quais outras metafísicas da pessoa humana se enquadram.

Palavras-chave

Hilemorfismo, Aristotelismo Tomista, morte cerebral, critérios para a morte.

Introduction

With the advent of various medical technologies, those who hold traditional medical and philosophical beliefs regarding the criteria of death have had to reassess their views and their ethical consequences.² Among such thinkers have been those who employ a hylomorphic

² An earlier version of this paper was published as “A Reexamination of the Hylomorphic Theory of Death” in *The Review of Metaphysics* 63:4 (June 2010): 843-870. This slightly revised version of the paper is published with the permission of *The Review of Metaphysics*. On the earlier version of the paper, I acknowledged David Hershenov, Peter Koch, Joel Potter, Susanna Spencer, Adam Taylor, and Mary Weber for comments and help. My thinking on death in relation to hylomorphism has developed significantly in the fifteen years since I published that earlier paper; above all, I would acknowledge Jim Beaugard, Peter Colosi, Turner Nevitt, Tim Pawl, and Marco Stango for influencing me on this issue. For published work of mine pertinent to the topic of this paper published since the original version of this paper, see the following publications of mine: “The Personhood of the Separated Soul,” *Nova et Vetera* 12:3 (Summer 2014): 863-912; “What is it Like to be an Embodied Person? What is it Like to be a Separated Soul?” *Angelicum* 93 (2016): 219-246; “Christologically Inspired, Empirically Motivated



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conception of the human person, on which we, like all material things, are composed of changeable matter configured by an unchanging form or soul.³

Though philosophers who hold this view agree that death involves the loss of the unified functioning of the human organism—such that the form, which during life structures matter and confers unity and identity upon it, causing it to constitute a human substance, is no longer present—differenthylomorphists have argued for each of the three criteria of death proposed in the literature today: the higher-brain criterion for death,⁴ the whole-brain criterion,⁵ and the circulatory-respiratory criterion.⁶ Many of the same passages in Aristotle and Thomas Aquinas, whose works are generally taken to be the primary sources forhylomorphism, have been used to support each of these theories.

In this paper I consider key passages in Aristotle, Thomas, and the contemporary literature on thehylomorphic theory of death and show to which claims about the cessation of the functioning of the human personhylomorphists must be committed. The most important issues here are the ways in which the form or soul relates to the body and its parts, the unity of

Hylomorphism,” co-written with Tim Pawl, *Res Philosophica* 93:1 (January 2016): 137-160; “The Separated Soul: Disability in the Intermediate State,” in *Disability in Medieval Christian Philosophy and Theology*, ed. Scott Williams (New York: Routledge, 2020): 235-257; “Survivalist, Platonist, Thomistic Hylomorphism: A Reply to Daniel De Haan and Brandon Dahm,” *Quaestiones Disputatae* 10:2, *Special Issue on Hylomorphism: Ancient, Medieval, Contemporary* (Spring 2020): 177-184; Foreword to Marco Stango, *Material Kenosis: A Metaphysical Essay on the Negativity of Death* (Eugene: Wipf and Stock, 2025); and above all *The Irreducibility of the Human Person: A Catholic Synthesis* (Washington: The Catholic University of America Press, 2022), chapters 7 and 8.

³ For this formulation see Eleonore Stump, “Non-Cartesian Substance Dualism and Materialism Without Reductionism”, *Faith and Philosophy* 12:4 (October 1995): 512. The fact that the soul *configures* the material of the body differentiates this account of the nature of the person from such theories as compound dualism. See Robert Pasnau, “Human Nature”, *The Cambridge Companion to Medieval Philosophy*, ed. A.S. McGraide (Cambridge: Cambridge University Press, 2003), 213.

⁴ See for example, Jason T. Eberl’s account of E.H. Kluge’s theory in “A Thomistic Understanding of Human Death”, *Bioethics* 19:1 (2005): 36-37; D. Alan Shewmon, “The Metaphysics of Brain Death, Persistent Vegetative State, and Dementia”, *The Thomist* 49 (1985): 24-80; William A. Wallace, “Aquinas’s Legacy on Individuation, Cogitation, and Hominization”, David M. Gallagher, ed., *Thomas Aquinas and His Legacy*, (Washington, DC: Catholic University of America Press, 1994), 179, 188-93.

⁵ Eberl defends this position in his article “A Thomistic Understanding of Human Death” as well as in his book *Thomistic Principles and Bioethics*, (London, England: Routledge, 2006), 41-61. In addition, various members of the Pontifical Academy of Sciences defended this interpretation in Antonio M. Battro, et. al., “Why the Concept of Brain Death is Valid as a Definition of Death: Statement by Neurologists and Others and Response to Objections”, Excerpt of *Scripta Varia* 110 (2008): 5-20. Shewmon also held this position for a time; see his article “Recovery from “Brain Death”: A Neurologist’s Apologia”, *Linacre Quarterly* 64 (1997): 58-61.

⁶ Shewmon, “A Neurologist’s Apologia”, 69-84.



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the human form, and the principal organ through which that form moves other organs. I argue that, in light of medical evidence, hylomorphists ought to be committed to the circulatory-respiratory criterion for death in most situations, with certain exceptions for some extreme cases. I show that this allows the hylomorphist to solve such thought experiments as Alan Shewmon's cerebrum transplant thought experiments, without treating a cerebrum transplant in the same way as a persistent vegetative state, and without dismissing such thought experiments as irrelevant to the issue of the criterion of death.⁷ Employing the circulatory-respiratory criterion of death also allows problems encountered by hylomorphists who employ a brain criterion, as well as problems encountered by those who espouse an animalist or closest continuer account of personal identity, to be overcome.

I first present the Aristotelian-Thomistic theory of the nature of the human person, focusing on the soul's functions as the act or form of the organism's matter, as the *telos* of the matter, and as the motor of the body. I present the hylomorphic definition of death as the loss of the form or soul by the organism; this will be explained as a loss of functioning, organization, and teleology. Next, I consider the issues of the unity and persistence of the soul, and the idea of the primary organ. This discussion will provide the evidence for my claim that, in the case of the use of certain modern technologies and in various thought experiments, aspects of death are pulled apart in such a way that the death of the whole brain does not necessarily indicate the death of the organism. Given the basic ideas of hylomorphism, the criteria for death will vary in different cases, but in normal situations the best criterion for death is the cessation of the capacity for circulation of oxygenated nutrient-bearing blood.

I. An Account of Hylomorphism

We must first consider the reasons for positing a theory of hylomorphism in the first place. Hylomorphism is the view that things are composites of matter and form.⁸ According to Aristotle, matter and form are first introduced to explain the coming into existence of a unified

⁷ Shewmon dismisses such thought experiments, including the one that he invented, in "A Neurologist's Apologia", 71.

⁸ What follows is drawn from: Aristotle, *Metaphysics* (hereafter *M*), VII.3.1029a3-6; VII.7.1032a15-1033a20; IX.7.1049a19-b1; *Physics*, I.7.189b33-191a2. All citations from Aristotle are from Richard McKeon, ed., *The Basic Works of Aristotle*, (New York: The Modern Library, 2001) unless otherwise noted. See Thomas Aquinas, *In duodecim libros metaphysicorum Aristotelis expositio* (hereafter *In Met.*), book VII, lect.6, n.1412. All citations of Thomas Aquinas are from aquinas.cc. See also Jiyuan Yu, "Two Conceptions of Hylomorphism in *Metaphysics ZHΘ*", *Oxford Studies in Ancient Philosophy* 15 (1997): 119. Aristotle understands the matter to constitute a thing in the sense that the matter is that out of which the thing is made and which survives the coming into being of the thing. No assertion is being made here regarding contemporary debates about constitution



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thing or substance, that is, a thing that subsists or exists in its own right, and that has properties, but is not itself a property of anything. Prior to a substance coming into being, its matter—the changeable stuff which potentially constitutes the substance, that is, which is able to be made into the substance—lacks the form of the substance. In coming into being, the matter takes on this form; in other words, it comes to actually be this substance, with the structure, unity, and nature of the substance. Form and matter are principles that are internal to a substance, rather than external forces acting on it. An important example of an external force is the efficient cause of the substance, that which makes the substance, that which introduces the form into the matter, unifying the matter, giving it the structure and essential properties of the new substance, actualizing the potentiality of the matter to be this substance.⁹ In any case, for any material substance, the form is the source of its essence—of what it fundamentally is, as the kind of thing that it is—and of all the activities of which the thing is capable, though in almost all cases these activities require matter for their implementation.¹⁰ The form is always prior to the matter in terms of importance for understanding the thing. In living things, the form is called the “soul.” As with any form, the soul is the internal principle in virtue of which an organism exists, is alive, and has its abilities; for a living thing, to be is to live and, so, to cease to live is to go out of existence.¹¹ For an organism to die is for it to go out of existence. Once this happens, its matter becomes structured by other forms; that matter comes to constitute other substance as the process of decomposition begins.

Aristotle defines the soul as “the first grade of actuality of a natural body having life potentially in it [that is] a body which is organized”.¹² By this he means that certain types of matter with a certain organization are potentially alive; to be alive is not just to have certain material parts interacting in the right way, or to perform various metabolic (or other biological) functions.¹³ Rather, for the hylomorphists, being alive—a state of being such that one moves oneself—is a state of existence, a way that a living thing actually *is*. Aristotle goes on to argue that this does not mean that there is chronologically first an organized lifeless body and then a soul comes and brings it to life; rather, the soul and the organized matter come into being

⁹ See Joseph F. Donceel, S.J., “Immediate Animation and Delayed Hominization”, *Theological Studies* 31 (1970): 83-84.

¹⁰ Aristotle, Peck, A.L. and Forster, E.S., trans., *Parts of Animals* (hereafter *PA*), (Cambridge: Harvard University Press, 1961), I.3.643a23; Thomas Aquinas, *Summa theologiae* (hereafter *ST*) I, q.77, a.1.

¹¹ Thomas Aquinas, *Quaestiones de anima* (hereafter *QDA*), q. 1, *respondeo* and ad. 1.

¹² Aristotle, *De anima* (hereafter *DA*), II.1.412a29.

¹³ See Eric Olson’s discussion of life in *The Human Animal: Personal Identity Without Psychology*, (Oxford, England: Oxford University Press, 1997), 126-31.



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together, but they are distinguished as form and matter.¹⁴ The soul gives structure and function to the matter as a whole and to each of its parts. Though Aristotle and Thomas think that a form can animate matter that has previously been shaped by another form, some form is always required for matter to retain organization and function; matter never exists apart from form. The essential work of a soul is animating matter. Not only is the soul that which unifies the matter, it is the source of the teleological (or goal-directed) powers that belong to each bodily part and to the body as a whole. To be a living thing is to have numerous powers or abilities; since these powers belong to what it is to be a living thing, they are conferred on it by its form or soul, though nearly all of them require matter as well: while an organism's powers belong to it essentially (and, so, to its form), they can only be exercised in matter. The body as organized by a soul includes many organs with different functions, each of which corresponds to one or more of the soul's powers.¹⁵

Eleonore Stump calls the soul “an essentially configurational state” of the body, for the soul configures the body to a certain structure and set of functions, and provides for their unified operation for the sake of the entire organism.¹⁶ The soul is not just an arrangement of matter but a real principle or cause that configures and unifies the matter. In non-human organisms the soul arises from certain arrangements of matter through the agency of the parent organisms: when parent organisms reproduce they rearrange matter such that it takes on a new form, a new actuality, unity, structure, and set of powers. Nevertheless, the form always transcends mere material states; it is a cause that confers properties on the matter, such as functioning for the sake of a unified end.¹⁷ The soul is thus the principle or cause of existence of the organism as a living thing, the principle of the configuration of the organism and of each of its organs, and the principle of integrated functioning for the sake of a single end. As the unchanging unity and actuality of the organism, it is the end of the functioning of the whole organism and of each of its organs: they all operate in order to maintain the unity and structure of the organism as a whole.¹⁸ At death, the organs cease to have their proper functions insofar as this includes acting for the sake of the whole organism's unified functioning. The loss of integrated functioning is a necessary condition for death on the hylomorphic view; this accords well with James Bernat's widely accepted definition of death in terms of loss of critical functioning of the organism as a

¹⁴ See also *DA*, I.1.412b25; Thomas Aquinas, *In Aristotelis librum de anima commentarium* (hereafter *In DA*), bk.2, lect.1, n.220-221.

¹⁵ *PA* I.5.645b15-21; *In DA* bk.2, lect.1, n.230-232; *In Met.*, bk.VII, lect.16, n.1634; *ST*, I, q.77, a.2 and 8..

¹⁶ Stump, “Non-Cartesian Substance Dualism”, 509; Jason T. Eberl, “Aquinas on the Nature of Human Beings”, *The Review of Metaphysics* 58:2 (November 2004): 335.

¹⁷ *ST*, I, q.90, a.2, ad.2; *QDA*, q.1; Stump, “Non-Cartesian Substance Dualism”, 510.

¹⁸ *In DA*, bk.2, lect.7, n.321-322.



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whole. ‘Critical functioning’ refers here to functions which are necessary for the “maintenance of life, health, and unity of the organism”.¹⁹

The soul is also the source of the movement of the organism.²⁰ We have already seen that the soul forms the material parts or organs of the organism in such a way that its various powers can be materially implemented. In other words, each organ has its power and structure in virtue of sharing in the overall structure and unity of the organism. It is in virtue of the organism’s form that the organism does all of its actions.²¹ In this sense, the soul provides the motive power for the organism to move itself: it can move itself because it is structured and actualized as the organism that it is. Thomas argues these two aspects of the soul are not equivalent to one another: the soul is the form and principle of life of the body as a whole, but it operates different powers through different individual organs in the body.²² Aristotle and Thomas both emphasize that although the soul forms and gives power to each organ directly, it moves the organs through a hierarchy of organs since there is a hierarchy of powers in the soul; on their view, there is a primary organ through which the soul’s motive power is communicated to the entire body.²³ Although we generally recognize life in an organism because of its spontaneous movements,²⁴ life in itself (that is, the ability to move oneself) and the operations or activities of the organism are not the same (that is, its actual acts of moving itself). Rather, the operation of the soul’s powers is a further actualization and a deeper sense of being alive over and above the formation of the body and bestowing of self-moving powers which is life in the most basic sense.²⁵ On this view, it is possible for the function of the soul as motor of the body to be lost without the function of the soul as form of the body being lost.²⁶ Death, which is the loss of the soul or

¹⁹ James L. Bernat, “A Defense of the Whole-Brain Concept of Death”, *Hastings Center Report* 28:2 (March-April 1998):17. Compare to *ST*, I, q.76, a.8.

²⁰ *DA*, II.4.415b11.

²¹ *DA*, II.1.412a10-12, 23-28.

²² For example: *In DA*, bk.2, lect.7, n.323; *QDA*, q.9, *respondeo* and ad.2; *ST*, I, q.76, a.4, ad.1; q.76, a.7, ad.1; a.8; q.77, a.1.

²³ For example: *PA*, III.4.665b14-27; 3.5.667b22-31; Aristotle, A.L. Peck and E.S. Forster, trans., *Movement of Animals* (hereafter *MA*), (Cambridge: Harvard University Press, 1961), 10.703a28-b2; *In Met.*, bk.7, lect.16, n.1634; *QDA*, q.9, *respondeo* and ad13; q.10, ad11. See also: Battro, “Brain Death”, 19; Eberl, “Human Death”, 31-32; Shewmon, “Metaphysics”, 64-65.

²⁴ *DA*, II.2.413b1.

²⁵ *ST*, I, q.77, a.1; Eberl, “Human Death”, 31.

²⁶ Thomas Aquinas, *Quaestiones disputates de veritate*, q.13, a.4, ad2; Eberl, “Human Death”, 32.



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actuality of the material parts of the organism, involves a loss of unity, *telos*, and functioning of the organism as a whole and of its parts, as well as a loss of the organism's self-moving power.

Only certain kinds of matter are fit to receive certain kinds of souls: souls of a certain kind can only inform and implement their powers in matter of a requisite kind and which has a level of organization sufficient to support that kind of soul.²⁷ The soul is the source of every organic function, but if it cannot implement any function in a particular piece of matter, the organism cannot exist. Material defects can cause the soul to be lost—that is, can cause death—because the form can only inhere in and actualize matter, which is disposed in a certain way, that is, matter that is of a particular kind and organization. Thomas gives as an example the loss of “breath” or respiration: when an animal ceases to breathe, the soul is lost, because without breath the matter ceases to have the requisite disposition to be informed or actualized by the soul.²⁸

On an Aristotelian hylomorphic view, the human soul differs from the souls of other organisms in that, while it is still essentially the form of the human body and the motor of the operations of each of a person's bodily organs, it is a non-material thing that subsists in its own right, and can perform some actions not in a material organ. We know this because of the human power of reason or intellect. In performing rational acts, the human person can know infinitely many things and can know abstract objects, including universals. Although such knowledge is based on what drawn from sense perception, it abstracts from all connections to individuality and matter. On this view, matter individuates; it restricts activities to considering individual things at particular times and places. In its ability to consider abstract objects, rational thinking is not so

²⁷ *DA*, II.1.412a29. Aristotle and Thomas think that as a living thing develops, it is informed by temporary transient forms before the matter reaches a sufficient level of organization to receive the final form. It first has a vegetative or nutritive soul which is educed or drawn forth from the matter by the seed or sperm of the parent of the new organism and is the intrinsic principle which causes the matter to first be organized and begin to develop. Then, if the living thing is an animal, an animal or sensitive soul emerges when a requisite level of material organization is reached. If the organism is human, it receives the rational soul only when the sensitive soul has formed the organs of the developing body to a point of sophistication at which they are disposed to support the operations of the rational soul. Each of these souls replaces and takes over the operations of the form which preceded it and also brings its own new functions to the organism; at each introduction of a new soul, a substantial change occurs so that a new being with a new life has been brought into existence. The newest soul takes over the matter that was configured by the previous form and so any defects in the matter (e.g. genetic defects) will be taken up into the new organism. See Aristotle, A.L. Peck, trans., *Generation of Animals* (hereafter *GA*), (Cambridge: Harvard University Press, 1979), II.3.736a24ff.; *DA* II.1.412b28; *ST*, I, q.118, a.2, *respondeo* and ad2; see also Donceel, “Delayed Hominization”, 79-80; Wallace, “Individuation”, 179-80.

²⁸ *QDA*, q.9, ad.16; *ST*, I, q.76, a.7, ad2; see also Eberl, “Human Death”, 33.



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restricted. Hence, it cannot take place in matter, or in a material organ like the brain.²⁹ While the intellectual power of the human person (which, like all of our powers, is rooted in our soul or form, that which unifies human persons and gives them their essential properties and powers) is separate from matter, it still depends on matter in the sense that (at least during embodied life) it requires information from the senses and the brain to operate. If the sense organs and the brain are destroyed, the immaterial intellect cannot operate while the soul informs the body.³⁰

Since the soul can operate to some degree apart from matter, is not created out of matter, and is that in virtue of which the composite human exists, the soul is also a subsistent thing in itself; as a form, it is incomplete unless it informs matter, but as a subsistent entity it is able, Thomas argues, to exist separate from matter, though this is not its ideal or natural condition. The separated soul still has rational powers, though these are in an unnatural state since the intellect cannot use sense perception as it naturally does when connected to the body; while a separated soul is still alive in the sense of being oriented to self-moved activities (like rational thinking), it cannot exercise most of its powers, since it is not informing matter.³¹

There is furthermore only one soul in the human person, on Aristotle and Thomas' views, since each human person is actually one, unified substance: that principle whereby the human person lives is the same principle whereby he knows and performs all his other activities. A person's soul tends to persist in informing the person's matter.³² Human death involves a loss of teleology by the person's matter. The matter ceases to act for the sake of the unified functioning and flourishing of the person. Total loss of teleological functioning by the matter is a necessary and sufficient condition for the death of any organism; the difference is that for a non-human organism, the form and the organism cease to exist entirely at death, since they have a purely material origin, while a human organism's form does not cease to exist. We must now consider what all this means in terms of *criteria* of death.

²⁹ *DA*, II.2.413b24-29; 3.4.429a10ff.; *GA*, II.3.736b27-29; Aristotle, W.D. Ross, trans., *Ethica Nicomachea*, X.7.1177b26-1178a8; *QDA*, q.1; *ST*, I, q.75, a.1-2. See also David Oderberg, "Hylemorphic Dualism", *Social Philosophy and Policy* 22 (2005): 86-92.

³⁰ *ST*, I, q.77, a.8; q.89, a.1.

³¹ *ST*, I, q.75, a.5, ad4; q.90, a.2, ad1; Stump, "Non-Cartesian Substance Dualism", 513-517; Eric Olson, "A Compound of Two Substances", available online at <http://www.shef.ac.uk/philosophy/research/publications/olsone.html>, pgs. 10-11, 13-15.

³² *DA*, II.2.414a4-14; *ST*, I, q.76, a.1.



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II. Death and the Unity and Persistence of the Soul

To respond to a thought experiment introduced by Alan Shewmon and its apparent implications for criteria of human death,³³ a hylomorphist must emphasize one and the same soul tends to persist in configuring the matter of the body. In posing his thought experiment, Shewmon asks what the smallest part of the body is that can support the human essence—that is, what the smallest part of the body is that can still constitute a human person. He then describes an imaginary situation in which first the head is removed from a living human body and both head and body are sustained separately by life support machines. The soul, it is argued, would continue to actualize the head, not the decapitated body, for the person’s conscious life could continue in the brain. Next, everything except the cerebrum is put in the body; the body now has functional unity in virtue of the coordinating activities of the brainstem, but the cerebrum still retains the original soul because it is there that personal rational activities, the highest functions, are able to continue. Finally, everything but the neocortex is placed in the body: the body now has powers for sense perception as well as vegetative powers (that is, non-conscious biological powers, like powers to metabolize, respire, and maintain homeostasis), but conscious personal life, and thus the original soul, is retained by the neocortex.

On this basis, Shewmon argues that the body without the neocortex is like a human being with dementia. When the neocortex is removed in the thought experiment, the soul “goes with” the neocortex so as to be able to implement its highest power of rationality, and the body undergoes a substantial change and becomes informed by a new non-rational animal soul. Likewise, Shewmon contends, a similar event would occur in cases of dementia where the neocortex is destroyed *in situ*: when the neocortex deteriorates, the rational soul departs—that is, the human person dies—and that soul is replaced by a new, non-personal soul or form. Prior to this event, the rational soul was the source of all the functions of the organism, but when it became unable to materially implement its highest powers, it departed, and another soul emerged to unify the remaining organism. Similarly, in posing this thought experiment, Shewmon likens the body without a cerebrum a person in a persistent vegetative state; here, on his interpretation, a substantial change occurs with the removal or destruction of the cerebrum so that the brainless body has only a vegetative soul. Finally, the body without any brain is like a person in a brain-dead state; here no unifying soul remains, Shewmon argues, but the brain-dead body is merely a collection of smaller organisms, the cells which remain alive but uncoordinated, each having its own form. Shewmon assumes here that the brain plays the role of the primary organ mentioned above in coordinating the rest of the body.

³³ This thought experiment was introduced in Shewmon, “The Metaphysics of Brain Death, Persistent Vegetative State, and Dementia.”



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On the basis of this thought experiment, it has been argued that, as at the beginning of life on some accounts of hylomorphism, so at the end of life there is a succession of souls, but in the opposite order. In death, the rational soul is succeeded by a sensitive animal soul (that is, a form that is the basis for sense-perceptual powers), which is in turn succeeded by a vegetative soul (that is, a form that is only the basis of non-conscious biological powers).³⁴ The death of the person, on this view, occurs when matter cannot support rationality.³⁵ Hylomorphism is used here to support a higher-brain criterion of death: the person dies when the brain deteriorates to the point that it can no longer support rational functions, regardless of whether the matter of the rest of the body continues to exhibit the operations of life. On this account, upon the death of the person, a new non-rational organism may come into being.

But this interpretation fails to take into account two important aspects of hylomorphism. These are based on the Aristotelian observation that things are teleologically oriented to remain in a natural state as long as they can, rather than succumbing to an unnatural situation. First, the soul is first and foremost the form of a body; in its natural condition it informs, structures, and unifies a body, and it will naturally tend to inform a body until material conditions deteriorate to the point where it simply no longer can do so. Second, the human soul is a rational soul and so will implement these powers in relation to matter as long as possible. However, if the implementation of its rational powers is not possible, the same soul will continue to implement its lower powers rather than separate entirely from matter and take on a separated existence in which it can only implement some powers unnaturally without matter. A human's persistence conditions on this interpretation of hylomorphism are based on the soul being able to implement its powers in the best and most natural possible situation given the above constraints, rather than on psychological continuity, continuity of consciousness, or on the apparent continuity of the same biological life.

Based on these points, the case of the destruction of the parts of the brain while still in the body (as occurs in some cases of dementia, vegetative state, and whole brain death) must be interpreted differently than the removal of the brain or its parts from the body (as is done in the

³⁴ The succession of souls at the beginning of life is not entailed by any basic hylomorphic claims. Rather, the zygote is suitable for being informed by the rational soul since the human person has a teleological orientation to develop rational powers from fertilization, as evidenced by the presence of the genetic material that will serve to produce the brain (see Eberl, *Thomistic Principles*, 26-8). The matter is the same sort of matter as the matter of a full-grown human person from the moment of fertilization in terms of genetic code (although at the zygotic stage, the DNA from egg and sperm have not yet been fully joined). There is no reason to retain the succession of souls theory which is based on a lack of knowledge about the matter of the embryo and the early fetus. The single soul, actualizing the same genetic material, gives the human being one unified integrated life over its entire history.

³⁵ See David Hershenov, "A Hylomorphic Account of Personal Identity Thought Experiments", *American Catholic Philosophical Quarterly* 82:3 (Summer 2008): 495-6; Wallace, "Individuation", 179, 188-93.



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three stages of thought experiment). On this interpretation, when the whole brain, the cerebrum, or just the neocortex is removed, the soul goes with it and continues to inform this small piece of matter. This is because the soul tends to both continue informing matter and to continue implementing the highest powers that it can in the matter available to it. When part of the brain is destroyed in the body, however, the soul remains with the body (rather than departing), implementing only its lower powers (though, still, the highest powers that it can implement under the circumstances), while continuing to inform matter. Only when the matter to which it is connected becomes completely unfit for being informed by the soul does the soul depart entirely, and death occurs.

In other words, only when the matter cannot be unified at all, and, so, cannot implement any human powers, does death occur. Recognizing these differences regarding the implementation of different powers allows the hylomorphist to overcome the difficulties that Shewmon has with how to treat these thought experiment cases now that he has repudiated his earlier belief in a higher-brain criterion.³⁶ There is no need to think that the brain transplant and the vegetative state cases need to be treated in identical ways. Recognizing the different functions that the soul is oriented to implement allows us to save the intuitions both that one “goes with” the brain in a transplant case and that one survives as a cerebrumless body in the case of persistent vegetative state.³⁷

It has been argued that this interpretation violates the ‘only x and y rule’, which says that if two objects x and y are identical, this identity cannot be affected by the status of a third object z not causally related to both. This seems to be a commonsense rule about the identity of things. The interpretation I have given here might be construed by some as a closest-continuer account of personal identity which violates this rule.³⁸ It might be argued that the person in the thought experiment is identical to the cerebrumless body only if there is not a cerebrum that is a better candidate for his or her survival elsewhere. This is a counterintuitive account of identity which might furthermore lead to the strange conclusion that if the removed brain is later destroyed, the

³⁶ Shewmon, “Neurologist’s Apologia”, 70-1.

³⁷ Eric Olson also treats the two cases identically, but he says that one stays with one’s body, not one’s brain and psychology, no matter what. See *Human Animal*, 17-18.

³⁸ For this objection see Hershenov, “Hylomorphic Account”, 496, but for a way in which this objection can be overcome see his article “APA Panel Talk on Organisms, Persons, and Bioethics”, *APA Newsletter on Philosophy and Medicine* 8:1 (Fall 2008): 8-11. For an explanation of the ‘only x and y rule’ and closest-continuer accounts of identity see Katherine Hawley, “Fission, Fusion and Intrinsic Facts”, *Philosophy and Phenomenological Research* 71:3 (May 2007): 604-5. For presentations of closest continuer accounts see Robert Nozick, *Philosophical Explanations*, (Cambridge: The Belknap Press of Harvard University Press, 1981), 29-37; Derek Parfit, “Personal Identity”, *The Philosophical Review* 80:1 (January 1971): 3-27.



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cerebrumless body will immediately become the person, as it would then be the best candidate for the person's survival. That, it would seem, cannot be: the person cannot suddenly "hop" from the brain to the body, just because the latter suddenly becomes the best candidate for the person's survival. There would also be the unfortunate consequence that, in certain cases, on this view, it might be uncertain which part is actually the person, if we cannot be certain which part has the best causal relation to the original whole person. But if two objects are identical, it seems that they should be identical no matter what is going on elsewhere: if the person "goes with" the brain in the thought-experimental transplant case, it seems that he or she ought to do so whether the brain "leaves" the body by removal or by destruction.

Hylomorphism can overcome this objection, however, because the soul, not other properties, is the guarantor of personal identity and cannot be divided or duplicated among many material substrates. Thus, the disembodied brain in the thought experiment is not just the best candidate for the person or the closest continuer of his psychology—rather, it really is the person because the brain is informed by the same soul by which the original whole person was informed. There is causal continuity and continuity of powers from the brain as it existed in the body to the disembodied brain, such that there is continuity of rational life, and, so, continuity of soul. If, however, the cerebrum is destroyed *in situ* (as happens in some cases of dementia) rather than being removed in a living state, the identity of the person would be ensured by the continued presence of the soul in the cerebrumless body, which would cause the various organs to still act for the sake of the unified end of the functioning of the whole organism. Again, the continuity of life shows the continuity of the soul. Furthermore, in the thought experimental case where the brain is removed, after the destruction of the brain, the cerebrumless body would not then become the person just because it would then be the best candidate for being the person. The continued presence of the soul in the brain or in the body is only dependent on where it can best implement its powers at the moment of separation, not on what is occurring elsewhere than the place where it is.

This might not be very helpful for an outside observer who wants to judge where the person is: the soul as such is not directly observable and, so, an observer might not know whether or not a particular cerebrumless but still living body was in fact informed by the same soul it had when it had a cerebrum. However, if hylomorphism is true, then the soul is a real metaphysical principle and so guarantees identity even if this identity cannot be directly ascertained in every case. No appeal to closest continuers or psychological continuity is needed because the presence of the soul alone ensures identity. In the case of cerebrum removal, a substantial change would occur in the body: a new soul would emerge in the cerebrumless body and the organs of that body would act for the sake of a new end, the functioning of the new non-



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human organism.³⁹ In terms of observable vital processes, no change would seem to have occurred aside from the removal of the cerebrum. However, if substances are defined in terms of forms and ends, the body which has had its cerebrum removed cannot be informed by the same soul, because this soul goes with the cerebrum. There is a new life in this organism because its organs are no longer acting for the sake of a unified, human, rational life. In neither cerebrum removal nor cerebrum destruction, however, has anything died.

Given that it is (with current technology) only a thought-experimental case, we can set aside the case of cerebrum removal and focus on the real-life case of brain destruction. It is clear from the foregoing that the person can survive upper-brain death; the same soul can continue to inform the person's matter, but without being able to implement its rational powers. In the case of upper-brain death, the soul continues to inform the body's matter, giving to each organ its structure and powers, all oriented to the unified end of the whole organism, and the soul continues to provide the motive power for the activity of these organs. This is because the cerebrum is not necessary for the vegetative life of the organism. However, it seems that the brainstem is necessary for these functions, as is the heart. These seem to be good candidates for the primary organ which Aristotle and Thomas posit as the medium through which the soul moves the body.

We must now consider whether the composite organism can survive the destruction of these organs, that is, whether it can continue to act for the sake of a unified end after their destruction or whether the destruction of one or both of these organs renders the body's matter unfit for being informed by the soul. We must examine what Aristotle Thomas say about the primary organ. On this basis, it will be determined whether the hylomorphist ought to be committed to a whole-brain or to a circulatory-respiratory criterion of death, or to some other criterion.

III. The Primary Organ and the Criterion of Death

Aristotle thinks that the soul, insofar as it is the principle that moves the organism, need not move each organ individually. Rather, the soul as form gives to each organ its function; it then moves one organ, and the other organs move or operate by reason of their attachment to that

³⁹ If the cerebrum were subsequently put back into the cerebrumless body—or into another cerebrumless but living body—the soul informing the cerebrum would then “re-inform” the whole body, again implementing all of its non-rational powers, since the matter would be adequate to receive this higher sort of soul, and this higher soul could take over the functions of any lower soul. In other words, the whole brain-body composite would again have a single, unified life, and all the organs would again serve that single, unified, rational life.



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one organ.⁴⁰ Through this primary organ, motion is communicated to the next organ on the hierarchy and so on to the all the organs. This ensures the unity of the operation of the entire body.⁴¹ The soul immediately forms each organ and directly gives each its function, but it carries out these functions in an orderly, hierarchical way by moving the organs by means of one another, like a system of interconnected gears or levers.⁴² Aristotle and Thomas both assert that the primary organ in humans is the heart, while many of their modern expositors say that the primary organ must be the brain. Here we must set aside the often erroneous biology used by Aristotle and Thomas and consider which elements of their theories are essential to hold so as to ensure a coherenthylomorphism in accord with correct biology. The chief reason that Aristotle asserts that the heart is the primary organ is that it is the mover of the blood, which is the carrier of the “vital heat” by which the organism stays nourished and in motion.⁴³ By moving the blood the heart disposes the other organs to perform their operations; if some organ loses this disposition, the organ cannot be informed by the soul and loses its connection to the rest of the organism.⁴⁴ Such loss of disposition would involve tissue necrosis of that organ and its disintegration due to its being cut off from oxygenated blood, which is the modern equivalent to the ancient notion of “vital heat.” The main role of the primary organ and the fluid that it moves is a vegetative function.

Many contemporaryhylomorphists focus on the fact that Aristotle and Thomas liken the primary organ to a ruler of a city, as well as the assertion that all other organs are dependent on the primary organ for their operation, to claim that the primary organ is actually the brain. The entire body is disposed to retain its form by the operation of the primary organ, and without this disposition the organism would not be able to act in a unified way, and the organism would die.⁴⁵ The brain, it is argued, controls the functioning of the entire body, including the vegetative functions that dispose the body to continue to be informed by the soul. On this account, the brain is the central integrator of the body; it would follow that death of the brain is a sufficient criterion for pronouncing a person dead. The primary organ, by its ruling action, disposes the

⁴⁰ *MA*, X.703a28-b2.

⁴¹ *PA*, III.5.667b22-31; *QDA*, q.9.

⁴² Aristotle uses the interesting metaphor of a marionette which moves itself by a system of weights and strings; the marionette, however, only moves and changes in one way, while the soul allows a living thing to move and change in many variable ways. See *MA*, 7.701b2-17; 10.703a12-19.

⁴³ *PA*, II.7.652b10ff.; III.4.665b14-16; III.5.667b22-31.

⁴⁴ *QDA* q.10, ad11.

⁴⁵ *MA*, 10.703a28-b2; *QDA*, q.10, ad4 and 11; q.11, ad16; Battro, et. al., eds., “Brain Death”, 19-20; Eberl, “Human Death”, 31-2.



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body to continue to be informed by the soul and to act for the sake of a unified end. Loss of this disposition is the criterion for death. Those like Alan Shewmon who now argue against the whole-brain criterion of death argue that the brain is not the central integrator or controller of the body, but just an organ that fine tunes and modulates already existing integrated bodily activity.⁴⁶

It is not clear from Thomas's presentation ofhylomorphism that neurological control is the right kind of control for the primary organ to have. While Aristotle understood the heart to have a role in implementing vegetative, sensitive, and cognitive capacities,⁴⁷ Thomas argues that principles of operation are spread out throughout the organs of the body. He argues that there are many principal organs relating to various powers of the soul, for the soul moves the body in different ways. However, all of these are dependent for being biologically or vegetatively maintained on the heart, which is the most primary organ.⁴⁸ Thomas understood that the brain is necessary for sensation, imagination, and other cognitive powers, and that it has an influence on the motion of the body.⁴⁹ Even Aristotle, although he did not understand the cognitive role of the brain, understood that the brain is necessary for the preservation of the whole organism, and that the brain controls our sleep-wake cycles.⁵⁰ In this same vein, Thomas observed that an injury to the brain causes the soul to lose the ability to actively understand and to direct itself in relation to the body.⁵¹ This seems to be textual evidence from the primary sources onhylomorphism that even prior to modern advances in physiology, the brain was seen to have primacy in controlling the body. Nevertheless, despite all of these observations about the brain, Thomas still insists on the heart being the primary organ. We must consider why, for the reasons have bearing on what the true conditions of death for the human person are on a hylomorphic view.

The primary organ is posited in the first place to provide for a corporeal expression of the hierarchy of powers in the soul. Since the soul is the principle which forms the organs and then provides them with motive power, it stands to reason that it will form them in accord with any hierarchies it has in itself. But Thomas distinguishes two hierarchies of powers in the soul. The first hierarchy orders the powers in terms of perfection: the intellectual powers come first, then the sensitive, and then the vegetative. But the second hierarchy reverses this order, placing the

⁴⁶ cf. Shewmon, "Neurologist's Apologia", 63-7.

⁴⁷ *PA*, II.1.647a25-35.

⁴⁸ *QDA*, q.11, ad.16.

⁴⁹ *QDA*, q.8; *Super epistolam beati Pauli ad Colossenses lectura*, caput 1, lectura 5.

⁵⁰ *PA*, II.7.652b3-7; 653a11-12.

⁵¹ Thomas Aquinas, *Quaestiones disputatas de spiritualibus creaturis*, a.2, ad.7. It will be argued that modern medical technology allows the soul to direct the body even in the case of at least some critical brain injuries.



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powers in the order in which they come into being in the development of the organism; thus the vegetative power provides the basis for the sensitive powers, which provide the basis for the cognitive and intellectual powers.⁵² We have already seen that Thomas allows that it is consonant with hylomorphic principles that these general groupings of powers be directed through different organs; they need not all be centered in one organ. An organ like the brain can have a great deal of control over the rest of the body and primacy with regard to the higher powers but still not be the primary organ absolutely speaking, that is, the organ that is primary in terms of the second hierarchy. The organ that is primary in that sense is the organ that provides the motive power and the vital disposition necessary for all the organs to be alive by moving the necessary “vital heat” and “spirits”.⁵³ Thomas understands “breath” to be a necessary part of this disposition which the body must have to stay informed by the soul, that is, to stay alive.⁵⁴ “Vital heat” and “spirits” can, due to their connection with breath, be equated in modern terms with oxygenated nutrient-rich blood. The heart has a greater claim to be primary than the brain does because the heart provides the force which moves blood to the organs of the body, providing them with what they need to stay alive. The other organs depend on the primary organ not to rule them in a conscious or neurological sense, but to provide them with the material they need to stay alive. Oxygenated and nutrient-rich blood, or a functionally equivalent substitute, is a necessary material condition for biological life, and it is thus the matter through which the soul provides its motive power.⁵⁵ The power which disposes and moves the other organs is provided by the blood, which is circulated by the heart, not by the brain, despite the fact that the brain has a role in modulating the beating heart.

If the primary organ is construed in terms of moving the substance necessary for life, the heart is still a better candidate for the primary organ than the brain. On a hylomorphic theory no organ constitutes the unity of the organs, for this is done by the soul. The motive power alone is mediated through organs and this is always construed in terms of actual movement, which applies to the heart more than to the brain. Still, in a contemporary medical context, there is probably good reason to reject the idea that there is a single primary organ absolutely speaking at all. While the heart is primary in a certain sense, it is clearly moved, in the sense under consideration here, by other organs, like the lungs (which provide oxygen for oxygenated blood)

⁵² *ST*, I, q.77, a.4, *respondeo*.

⁵³ *QDA*, q.8.

⁵⁴ *ST*, I, q.76, ad1 and 2.

⁵⁵ For an argument that vital forces are primary for Aristotle see Lloyd, “Zoology”, 153-6.



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or the digestive organs (which provide nutrients for nutrient-rich blood). Still other organs (say, the mitochondria) might be primary in yet other senses.⁵⁶

In the context of the contemporary discussion of death as it relates to artificial life support systems, the question then arises whether the function of the soul as form of the body and the soul's function as motor of the body might be separated.⁵⁷ It seems that under ordinary conditions a serious brain injury would preclude "primary" organs like heart and lungs from continuing to function. This would lead to a loss of the material disposition necessary for the soul to continue informing the body. Under the conditions in an intensive care unit, however, things might be different, since there the influence of the brain on the vegetative organs can be replaced with machines. Under those circumstances, it is not so clear when the body has died.⁵⁸ For a correct hylomorphic interpretation of this situation, it must be kept in mind that an organism is alive when its soul is animating its body, that is, when the organism is self-moved in some way. Thus, some activity of the body must be able to be attributed to an internal source; there must be some activity of the whole organism that cannot be entirely explained in terms of external forces, such as the operations of a machine.

We have already seen that Thomas allows that on a hylomorphic theory different organs can be primary, that is, moved by the soul, in different senses. If brain-mediated modulation of the body has failed due to brain-death, and spontaneous heartbeat has stopped along with the cessation of operation of other vegetative organs, it seems that, especially in light of the latter, the soul has ceased to be the motor of the body because it has ceased to move oxygenated, nutrient-rich blood. However, if a machine compensates for the heart's motive power before the loss of circulation becomes irreversible, it seems that the body could continue to be informed by the soul—that is, the various organs could continue functioning in service of a single, unified, overall life. In such cases, many spontaneous integrative activities of the whole organism, such as bodily growth, maintenance of homeostasis, digestion, excretion, and the fighting of diseases, continue.⁵⁹ In hylomorphic terms, in these cases, the soul continues to implement its powers through the body's organs. There is no need for another organ to become a primary organ; a

⁵⁶ I owe this point to private correspondence with Alan Shewmon.

⁵⁷ Eberl argues that for Thomas there are two senses of death for these two functions of the soul, but that Thomas argues that the two deaths always coincide. I am arguing that machines allow for these two deaths to come apart. See "Human Death", 32.

⁵⁸ Cf. Joanne Lynn and Robert Cranford, "The Persisting Perplexities in the Determination of Death", Stuart Younger, Robert Arnold, and Renie Schapiro, eds., *The Definition of Death: Contemporary Controversies*, (Baltimore, MD: The Johns Hopkins University Press, 1999), 101-2.

⁵⁹ Shewmon, "Neurologist's Apologia", 68.



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primary organ is not necessary for life as can be seen from the fact that there was no primary organ in the embryo⁶⁰ and the action of a primary organ or organs can be taken over by a machine, since all that is needed is that the material disposition for continued information by the soul remain.

It seems, then, that the soul can continue to inform the body even when it has ceased to be the motor of the body if another source of motive power source is provided.⁶¹ In this case the machine that compensates for circulatory or respiratory deficiencies is not part of the organism, but is an external motive power source that allows the necessary material disposition to remain so that the soul can continue to inform the body and provide the internal source of the functions of the remaining integrated living organs. A similar set of events occurs in the thought experiment about the disembodied brain: the material disposition, that is, the oxygen and other nutrients necessary for life, would be provided by an external source, but this would allow the internal functioning of the brain to continue to be an implementation of the soul's powers. The organism can survive the death of a primary organ, provided that another source can continue to provide circulation of oxygenated blood to the other organs and provided that holistic internal functions, such as the organism's maintenance of homeostasis for the sake of the organism as a whole, can continue. The soul's informing of those organs unifies them until the body breaks down to the point where it can no longer support this unity, and death occurs.

Irreversible loss of the capacity for the circulation of oxygenated, nutrient-rich blood (or its functional equivalent) is the best current medical criterion for death, as whole-brain death does not necessarily cause the soul to cease informing the body, and loss of the capacity for circulation means the loss of the material disposition necessary for the soul to inform the body's matter. While cessation of the capacity for circulation seems to be a sufficient condition for death in normal cases, the continuation of some holistic integrative function which can be accounted for in terms of an internal principle is a necessary condition absolutely speaking for the continuation of the same life. Death occurs when all holistic bodily functions irreversibly cease, though in nearly all cases this will occur when circulation ceases. It is an empirical medical

⁶⁰ One could make the case that the cell nuclei are multiple primary organs in the embryo. However, these do not provide the material disposition for the life even of their own cell, let alone the whole embryo, nor do they even exist during mitotic division, and so there does not seem to be a primary organ at the embryonic stage. See Hershenov, "Book Review of *Thomistic Principles and Bioethics* by Jason T. Eberl", 193-4. The embryo also provides an interesting parallel to a live brain-dead patient: neither has a brain yet each exhibits vital functioning.

⁶¹ This could also help to explain the case of high cervical cord transection in which the brain is cut off from the rest of the body, which is then kept alive with machines (Eberl, *Thomistic Principles*, 59). Even if the brain were the primary organ, the soul could still inform the whole body, but would cease to be the mover of the entire body. Since integrative operations such as circulation would still encompass both the head and the rest of the body, the same form could still actualize each.



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question as to which functions count as holistic and integrative; the essential point here is that, on a hylomorphic view, in light of current medical knowledge, whole-brain death does not entail the cessation of all bodily functions and so does not entail death.

IV. Conclusion

Many hylomorphists have argued that the proper criterion of death is some sort of brain death. I have argued against this in favor of the circulatory-respiratory criterion in most real-life cases, and a criterion of the cessation of holistic integrative functions for every case. First, I pointed out that the soul relates to the body both as its form and as the source of its motive power. As its form it gives function to each organ and unity to the whole organism. It does not depart with higher-brain death but continues to provide the functions of the remaining organism. One can, I argued, make sense of both higher-brain death and the cerebrum removal thought experiments on a hylomorphic view, without resorting to a higher-brain criterion of death, since the soul seeks to implement its rational capacities, but seeks more strongly to continue informing matter. Against the whole-brain criterion of death I argued that the heart is a better candidate than the brain for being the primary organ through which the soul provides motive power to the body. Furthermore, the role of the soul as motor can be compensated for by a machine, allowing the soul to remain as the form. Thus, death occurs when integrative functions cease; this is generally indicated by the cessation of the circulation of oxygenated, nutrient-rich blood. Much more work would need to be done to see what the ethical consequences are with regard to organ procurement and withholding of extraordinary treatment on the basis of this interpretation of death. However, it seems to me that adhering to these criteria is the only way to stay true to all that Thomas and Aristotle say regarding hylomorphism as well as to the evidence of modern medicine.