

Michael Nair-Collins

A Biological Theory of Death: Characterization, Justification, and Implications

Diametros nr 55, 27-43

2018

Artykuł został opracowany do udostępnienia w internecie przez Muzeum Historii Polski w ramach prac podejmowanych na rzecz zapewnienia otwartego, powszechnego i trwałego dostępu do polskiego dorobku naukowego i kulturalnego. Artykuł jest umieszczony w kolekcji cyfrowej bazhum.muzhp.pl, gromadzącej zawartość polskich czasopism humanistycznych i społecznych.

Tekst jest udostępniony do wykorzystania w ramach dozwolonego użytku.

A BIOLOGICAL THEORY OF DEATH: CHARACTERIZATION, JUSTIFICATION, AND IMPLICATIONS

– Michael Nair-Collins –

Abstract. John P. Lizza has long been a major figure in the scholarly literature on criteria for death. His searching and penetrating critiques of the dominant biological paradigm, and his defense of a theory of death of the person as a psychophysical entity, have both significantly advanced the literature. In this special issue, Lizza reinforces his critiques of a strictly biological approach. In my commentary, I take up Lizza's challenge regarding a biological concept of death. He is certainly right to point out that science is not value-free; however, this does not imply that there cannot be a characterization of biological death that can be shown to be superior to other concepts. After characterizing and justifying such a theory of biological death, I show that patients who meet the diagnostic criteria for brain death are unequivocally biologically alive. However, with respect to concepts of personhood and related ideas (as opposed to biology), I urge the acceptance of a pluralism of such concepts for matters of public policy.

Keywords: Lizza, death, definition of death, brain death, neurological criteria for determining death.

Professor John Lizza has been a major figure in the scholarly debates on the criteria for human death for over 25 years. His penetrating and careful work has significantly advanced the literature, especially his 2006 book, *Persons, Humanity, and the Definition of Death*, a sustained critique of the dominant biological paradigm for understanding human death.¹ In general, Lizza argues that any theory of human death that ignores the cultural, moral, ontological, and practical context within which questions about death are asked, will be an inadequate theory. Furthermore, to focus solely on biology to the exclusion of these other philosophical and value-laden perspectives is to distort our nature as human beings.

In “Defining Death: Beyond Biology,” Lizza reinforces his long-standing challenge to the biological approach in two ways.² First, he argues that what it means for an organism to be integrated as a whole is vague and cannot be made

¹ Lizza (2006).

² Lizza (2018).

explicit without appealing to the interests, values, and ontological considerations by which we individuate living things. In other words, the biological concept of death is not and cannot be value-free; so the project of defining a “purely” biological or scientific concept of death will not succeed. Second, he argues for a semantic bifurcation of the term “death”: one for death of the organism, and one for death of the person. With respect to the death of the person – the death that matters, the death of who we are as human beings – brain death is death. Individuals meeting diagnostic criteria for brain death lack capacity for consciousness and all mental functions, hence, the psychophysical integration necessary for existence as a human person has ceased, so brain death is death. Even if the body may remain alive in some sense, it is the remains of a human being; it is no longer “one of us.”

In this commentary I take up Lizza’s challenge regarding a biological theory of death. He is certainly correct that science is not and could not be value-free. But this does not imply that the development of a biological characterization of death is a conceptually confused or doomed project. I will outline a theory of death motivated by modern physiology; explain its (value-laden) justification; and note its implication that brain dead patients are biologically alive. Second and more briefly, I argue that Lizza is correct in insisting that we recognize the practical, moral, and legal contexts within which this debate takes place. However, he draws the wrong conclusions from attending to these contexts. Rather than endorsing a univocal concept of death of the person, which draws on long-standing Western philosophical traditions, I argue that instead we must allow for a pluralism of concepts of persons, selves, moral status, and what makes a life worth preserving.

A Biological Theory of Death: Characterization, Justification, and Implications

I will argue that there is a single, objective, rationally defensible theory of the biological death of the human organism. Furthermore, appeal to this theory settles the question of whether brain dead patients are living or dead: They are unequivocally alive. As a caveat, note that this claim does not imply that the essential nature of a human being is to be given in purely biological terms, nor that there even is an essential nature of a human being, and it does not propose necessary and sufficient conditions for any canonical concept of death. It also does not imply anything about personhood and related concepts, or how these concepts apply (or not) to the brain death debate. Additionally, I make no moral claims in this section regarding organ procurement, justice in the use of healthcare resources, and so on.

To evaluate a biological theory of death, it is necessary to step back and examine theory selection more broadly. In general, what makes one scientific theory better than another? What is the rational warrant for endorsing one theory over another? For these questions, it is useful to examine the aim of (idealized) scientific inquiry: Fundamentally, (idealized) scientific inquiry aims to explain; we seek to explain specified phenomena in a way that yields enhanced understanding of the world. Because of this basic aim, inference to the best explanation is a foundational form of scientific reasoning: the theories which best achieve the basic aim of scientific inquiry – that is, those that are the best at explaining – are the theories we ought to endorse.

Inference to the best explanation is also a fundamental inference pattern in experimental reasoning. Although there are qualifications and complications (some mentioned in parentheses below), the basic pattern is as follows:

1. If hypothesis H is true, then I should observe outcome O (under experimental conditions E, operationalized by criteria C, statistically analyzed with procedure P, and assuming background conditions B₁-B_n).
2. I observe O.
3. The best explanation for my observing O (under experimental conditions E, etc.) is that H is true.
4. Therefore, H should be accepted as true (provisionally, always subject to further testing and revision, and subject to revision or rejection of the background assumptions, etc.).

For both these reasons, inference to the best explanation is a foundational and indispensable element of scientific inquiry and theory selection. But inference to the *best* explanation is a normative, value-laden endeavor, since it involves making evaluative judgments about proposed explanations, hypotheses, or theories. There is a long-standing project in the philosophy of science of identifying those characteristics, called “theoretical virtues,” which make for a good explanation. Simplicity is a well-known theoretical virtue, holding that, all else being equal, a simpler explanation is to be preferred. Another virtue is elegance, which is perhaps more commonly invoked in discussions of mathematical or logical proofs, but it is also invoked as a virtue with respect to scientific theories.

Unification and coherence are important theoretical virtues as well. A theory or hypothesis that unifies disparate phenomena under a single ontological or theoretical framework is better than one that posits multiple kinds of entities or multiple theoretical frameworks. Similarly, an explanation or theory that coheres well with other well-accepted theories and conceptual frameworks, all things considered, is better than one that does not enjoy such coherence.

These criteria share similarities. In essence, they recommend ontological parsimony, explanatory simplicity, and a coherent, unified, elegant theory of the world. Thus it makes sense that the main theoretical vice does the reverse. Multiple ad hoc constructions, devised solely for the purpose of saving a view from falsification, and unmotivated by or disconnected from well-accepted ideas in a different context, are to be avoided.³ Unfortunately, much of the literature that allegedly approaches brain death from a biological perspective is riddled with such ad hoc revisions.⁴

There are also *epistemic values* attached to (idealized) scientific inquiry, such as a fundamental commitment to truth and objectivity over other potential values. This is not a mere truism – as Dan Brock has aptly pointed out, there are occasions in which conflicts between truth and consequences can occur in bioethical scholarship.⁵ The epistemic value of a commitment to truth over all other values is, itself, a normative commitment that is a component of idealized scientific inquiry. Finally, the real practice of science (as opposed to ideal inquiry) is thoroughly intertwined with values and interests, because it is embedded within a social, cultural, economic, historical and linguistic context, just as Lizza notes. Such values and interests include especially the question of what to study and how to study it; in today's academic world, these questions are unfortunately most often determined by those who fund scientific inquiry, rather than by scientists themselves.

Thus, the practice of science (and scholarship more generally) is certainly not value-neutral. It cannot be disconnected from the sociocultural and economic context within which it is practiced. It does not float freely from underlying ontological assumptions nor from the categories and constraints demanded by a particular linguistic and conceptual framework. Furthermore, there are basic epistemic values that inform scientific practice, especially a commitment to truth and objectivity above other potential values. Perhaps most importantly, as a general matter, commitment to particular scientific theories is fundamentally a normative endeavor, because it is rooted in inference to the best explanation, which depends on evaluative and indeed aesthetic criteria. This does not imply, however, that we commit any error in attempting to articulate a biological theory of human death. Quite to the contrary; it enables us to see more clearly the evaluative criteria we ought to use in pursuing that project.

³ Lakatos (1970); Popper (1963).

⁴ Nair-Collins (2015a).

⁵ Brock (1987).

A Biological Theory of Death

To develop a biological theory of death, I begin by reviewing a few key concepts. The human body consists of about 100 trillion cells, all of which are surrounded by fluid, known as *extracellular fluid*. This fluid is in constant motion, transported in the blood and passing across capillary walls through passive diffusion. As a result of the constant mixing and motion, the extracellular fluid maintains a relatively homogenous composition throughout the entire body.⁶ For this reason, it is also known as the *internal milieu*, or internal environment, because it constitutes the environment within which all of our cells live. Fascinatingly, a component of the extracellular fluid, blood plasma, is suspected to roughly approximate the composition of the primordial seas at the time of the earliest migration of organisms from sea to land, in the Paleozoic era.⁷

Like the human organism, the human cell can only function when its environment remains within certain limits. The cell's environment, however, must remain far more tightly controlled than that of the organism. The extracellular fluid contains the oxygen, glucose, ions, lipids, nutrients, and other factors needed for the cell to function and survive. The process of maintaining the extracellular fluid within these limits is known as homeostasis and, critically, *maintaining homeostasis of the extracellular fluid cannot be localized to any individual part of the organism*. Maintaining homeostasis of the extracellular fluid is not merely one among many functions of different parts of the organism; rather, it is the central function of the entire organism, because it makes possible all other cellular, organ, and organismic functions. *All cells both require and contribute to maintaining homeostasis of the extracellular fluid.*⁸

For example, there are a number of ions whose concentration within the extracellular fluid must be tightly controlled for the cell to survive, including hydrogen and bicarbonate (which jointly determine pH), sodium, potassium, magnesium, calcium, chloride, and phosphate. If any one of these ionic concentrations greatly exceed its boundaries (upper or lower), then the cell will not long survive. Maintaining these concentrations is a joint function of the kidneys, lungs, hypothalamus, posterior pituitary, pancreas, adrenal glands, parathyroid glands, bone, liver, intestines, the bicarbonate buffer system within the extracellular fluid, and

⁶ To clarify, the extracellular fluid has two major components: plasma, a component of blood, and interstitial fluid, which is the fluid surrounding cells (outside of blood). Certain proteins in plasma cannot pass through capillary walls, thus it would be more precise to say that, apart from those proteins, the composition of the extracellular fluid is roughly homogenous throughout the body.

⁷ Banfalvi (1991).

⁸ Hall (2016).

the hemoglobin buffer in red blood cells.⁹ Similarly, energy storage and regulation is a function of the stomach, pancreas, gallbladder, liver, small intestine, enteric nervous system, muscle, and of course the production of ATP, the final step of which occurs in the mitochondria of all cells.¹⁰ And there are many other physiologic parameters of the extracellular fluid that must be maintained within specific limits, whose control is a function of multiple organs, tissues, and cells throughout the organism, operating in a mutually interdependent fashion.

Maintaining homeostasis of the extracellular fluid is an energy-demanding process that fights against entropy, or the tendency towards chemical and thermal equilibrium described by the second law of thermodynamics. This basic feature of the known universe explains passive diffusion across cell walls, as well as why a hot cup of coffee will soon come to room temperature. For example, the sodium-potassium pump, which maintains balances of sodium and potassium within and outside the cell wall, requires energy because it pumps these ions against their electrochemical gradient (against equilibrium), thus maintaining the concentration differences necessary for so many cellular functions.

A final key concept is that of homeostenosis as applied to theories of aging.¹¹ The idea is that as we age, the organism's overall physiologic reserves, or capacity to maintain homeostasis against stress, begins to diminish (or "stenose"). Because of this, the same amount of environmental or physiologic stress poses a greater threat. For example, a trip and fall in an otherwise healthy thirty-year-old might create a bruise or scraped skin, but would not pose too much of a threat. But a fall in a very old person, especially someone who is frail, is a grave threat to their health and even life. It often signals the beginning of their functional decline, because their physiologic reserve is much lower. Taking the idea of homeostenosis to its natural conclusion, when the organism no longer has the ability to restore homeostasis, the organism has died.

Putting these ideas together, I propose that we can think of living biological organisms in two (mutually consistent) ways. First, living organisms are localized pockets of anti-entropy, achieved by mutually interdependent functional structures jointly maintaining internal equilibrium, or homeostasis of the extracellular fluid, a necessary condition for all organismic function, while resisting chemical and thermal equilibrium with the external environment. Second, living organisms are a social collective, consisting of trillions of cells working together to actively

⁹ Ibidem.

¹⁰ Ibidem.

¹¹ Khan et al. (2017).

maintain their environment within conditions suitable for their continued functioning and existence. As mentioned above, it is as if we carry something like the primordial seas within us; by working together to create an external barrier and a mobile skeletal frame, this social community of cells has managed to take their needed external environment with them and leave the constraints of the sea for adventures on land.

These ideas suggest a theory of biological death, which can again be characterized in different (yet mutually consistent) ways. Namely, death is the irreversible cessation of the organismic capacity to maintain homeostasis of the extracellular fluid and thereby resist entropy. Extending the homeostenosis concept of aging, death is the limit beyond which homeostasis cannot be restored, when physiologic reserves are spent. Death is thus an event, not a process. It is a thermodynamic point of no return, a state-discontinuous point beyond which entropy and disintegration take over. By analogy, consider the threshold potential of a neuron. Ions are constantly moving in and out of cells, creating a constant flux of current and hence voltage. But when that voltage difference across the cell wall reaches a particular threshold, an ineluctable set of biochemical mechanisms is triggered, which creates an extremely rapid, exponential change in voltage known as an action potential. The threshold voltage is the point of no return, separating the minor flux of the resting potential from the qualitatively and massively quantitatively different condition of the action potential (from which the cell must then “recover”, allowing the process to continue again).

It must be emphasized that the above suite of ideas is really only a sketch of a theory, rather than a fully worked-out theory of death. There is much work to do in the philosophy of biology and the philosophy of death in precisely characterizing these concepts. The “capacity to maintain homeostasis” is a multivariate capacity, composed of a nonlinear function of multiple physiological capacities as well as pressures, concentrations, temperatures etc., which themselves are nonlinear functions of many variables, both internal and external. Greater specification of the component variables and how they interact to compose the multivariate capacity to maintain homeostasis of the extracellular fluid, along with greater specification of the “point of no return” are all important theoretical desiderata. It is likely that these concepts can be modeled using differential equations and concepts from dynamic systems theory. But any modeling will inevitably result in a significant oversimplification of the extraordinarily complex physiological reality.

Furthermore, it seems likely that a perfectly explicit, mathematically rigorous characterization of the thermodynamic point of no return will not be achieved.

Instead, it may remain a theoretical point only. But, like a center of gravity or a frictionless plane – or a point or a line, for that matter – idealizations have great utility in scientific theorizing and are nonetheless accepted as real entities; or at least, as approximating entities which themselves are real. However, this point of no return, described in terms of “irreversibility” above, is not relative to the interests and concerns of those standing by with resuscitative equipment. It is a physiologic threshold, just as a threshold potential is. But, this “final threshold” is a function composed of a huge number of variables, rather than the single variable of voltage across the cell wall.

Granting that what I have outlined is a sketch or schema rather than a fully worked out version of the theory, nonetheless enough has been articulated to begin evaluating its (value-laden) justification. Namely, what are its theoretical virtues? The most important consideration is that the theory is not ad hoc. It is not designed to reach any particular socially, ethically, politically, or practically palatable conclusion. Instead, it is derived from, and likely implied by, other well-accepted concepts and theories which themselves have great explanatory and manipulative utility in medicine and physiology. It draws from one of the foundational concepts in physiology, homeostasis, while simultaneously extending the homeostenosis concept of aging to its natural conclusion. Furthermore, it is consistent with and draws on broader concepts, including evolution and the composition of the primordial seas, as well as basic constraints from physics and thermodynamics. Therefore, the theory is part of a coherent, unified story of the world and our place in it, drawing on a well unified ontology within a mechanistic explanatory framework. It is reasonably simple and, in my humble opinion, I find the ideas quite elegant.

Thus I submit that the theory outlined above is the best extant theory of biological death, and hence we ought to accept it, provisionally. The theory is always open to revision, improvement, and even complete rejection if replaced by a better theory. Such a better theory, however, must have greater explanatory utility and manifest all of the above theoretical virtues and more. The theory that overthrows this one must fit cleanly and coherently within a unified ontological and explanatory framework that is itself well accepted on independent grounds and draws from or is coherent with multiple other domains of scientific inquiry. Awaiting such a future improvement in our understanding of death, or even a complete conceptual overthrow of our basic mechanistic picture of the physical world, I emphasize that this is the best theory on offer according to well-accepted theoretical virtues, and therefore by inference to the best explanation, we ought to provisionally accept it.

Assuming the homeostasis theory of death (as I will call it henceforth), the implications for brain death are obvious. The patient meeting brain death criteria, supported with mechanical ventilation, is clearly biologically living. The patient is actively maintaining homeostasis of the extracellular fluid, a necessary condition for all organismic functions, and which is itself a product of multiple, mutually interdependent functions of effectively the entire organism, and which cannot be localized to any part of the organism.

One response is to point out that the ventilator is responsible for these functions. For example, the U.S. President's Commission in 1981 wrote that "the lungs breathe and the heart circulates blood only because the respirator (and attendant medical interventions) cause them to do so, not because of any comprehensive integrated functioning."¹² Similarly the U.S. President's Council on Bioethics wrote in 2008 that "artificial, non-spontaneous breathing produced by a machine is not [...] [a vital] sign [...] the exchange of gases that it effects is neither an achievement of the organism nor a sign of its genuine vitality."¹³ Both of these claims are false.¹⁴ They are based on an overly simplistic and thoroughly inadequate appreciation of the physiology involved in, for example, gas exchange, or a beating heart. The intrinsic automaticity of the sinoatrial node of the heart, for example, cannot manifest except within the context of an internal milieu that meets cellular requirements for concentrations of ions, nutrients, and so on. The ventilator is incapable of meeting those requirements. Similarly, the exchange of gases at the alveoli occurs by passive diffusion – but that passive diffusion is only possible because the pneumocytes actively maintain a barrier and a differential concentration of gases, which is an active process that opposes the natural equilibrium of oxygen and carbon dioxide on each side of the barrier. When that happens, passive diffusion cannot occur, and hence neither can gas exchange. But pneumocytes, like cardiac conductive and muscle cells, and like all cells, both require and contribute to the maintenance of homeostasis in the extracellular fluid.

The ventilator blows air in and out of the bronchial tree. In a patient who is incapable of generating air flow through the bronchial tree (for any cause), the ventilator is life-sustaining treatment, because it provides a necessary condition for life that the patient cannot otherwise maintain. But it does not cause the heart to beat or gases to exchange, nor does it maintain ionic concentrations, nutrients,

¹² President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Biobehavioral Research (1981): 22.

¹³ President's Council on Bioethics (2008): 63.

¹⁴ Nair-Collins, Miller (2017).

energy stores and metabolism, protection from invading pathogens, circulation, and so on. The organism must do all of this. This is important to note because Lizza, following many others, frequently refers to the brain dead patient as being “artificially maintained” or “artificially supported.” The brain dead patient is no more and no less “artificially maintained” than any other patient on a ventilator; or on insulin, for that matter.

Aristotelian Challenges

In 2008, the U.S. President’s Council for Bioethics acknowledged that patients meeting diagnostic criteria for brain death continue to function as an integrated whole, for example because they can heal wounds, fight infection, and maintain temperature. However, the council did not thereby conclude that brain dead patients are biologically living. Instead, they argued that the degree of “integrated functioning” was not sufficient for the organism to remain a biologically living organism. The council offered a “vital work” theory of life, whereby an organism must exhibit a fundamental drive to continue to exist, manifested through its exchanges with the environment.¹⁵

Lizza has pointed out, correctly, that the council’s appeal to such concepts as a fundamental “drive” and a “felt need” are not modern biological concepts but draw on Aristotelian metaphysical presuppositions. (Note that “felt need” does not advert to conscious perception or feeling in the ordinary sense of the term: even patients in a vegetative state exhibit such a “felt need” according to the council.) “Under the guise of biological talk about an organism’s integration with its environment,” Lizza writes, “the Council is in effect defining death as the departure of the animating or vital principle from the body.”¹⁶

A few authors more recently have taken up the Aristotelian perspective to generate a challenge to the homeostasis theory of biological death, such as Condic¹⁷ and Moschella.¹⁸ Similar to the council and to Condic, Moschella argues that brain dead patients exhibit “low-level” integrated functioning involving co-ordination between living parts, but this kind of integration is not enough or not the right kind of integration to entail the existence of an “organism as a whole.”¹⁹

Importantly, while the President’s Council’s Aristotelian presuppositions are not made explicit, both Condic and Moschella explicitly acknowledge such

¹⁵ President’s Council on Bioethics (2008).

¹⁶ Lizza (2018): 14–15, fn. 48.

¹⁷ Condic (2016).

¹⁸ Moschella (2016).

¹⁹ *Ibidem*.

assumptions. Moschella's articulation of her metaphysical presuppositions is worth quoting at length (all emphases in the original):

On an Aristotelian-Thomistic hylomorphic account, it is the form or soul that is the cause of the unity of a living being. The soul is in *every part* of that being, and it is the source (as formal principle) of all of that being's actions, operations and capacities [...]. Every living being has one, and only one soul, one substantial form that accounts for the unity, essential identity and integrated functioning of the organism. Each *human* being has one soul, a *rational* soul, that makes the body *be* a body (as opposed to an aggregation of molecules) and be a *human* body [...]. The rational soul is the formal principle of the unity and essential identity of the human person as a psychophysical substance, and the source (as formal principle) of all of the human being's actions, operations, and capacities, ranging from vegetative functions like metabolism and homeostasis to rational activities like engaging in a philosophical dispute.²⁰

In a footnote, she also notes that

[...] only a defense of the neurological criterion for death that is in line with an Aristotelian-Thomistic anthropology will be acceptable to the Roman Catholic Church, which is the largest nongovernmental provider of health care in the world, and which has significantly influenced the brain death debate from the very beginning.²¹

Lizza declines to comment on the adequacy of an Aristotelian-Thomistic view of our nature or its success in defending brain death as death of the human organism. Instead, he uses these ideas to simply point out that assertions about whether the organism is an "organism as a whole," or whether the functioning of a brain dead patient is "integrative," are fundamentally tied to philosophical, metaphysical presuppositions.²²

Lizza is certainly correct about this point. However, it is precisely by examining these ideas within their set of broader metaphysical presuppositions that we see that the Aristotelian-Thomistic challenge is no challenge at all to the homeostasis theory of death.

²⁰ Ibidem: 284.

²¹ Ibidem: 294, fn. 3.

²² Lizza (2018).

As discussed above, no theory is free of axiological and ontological presuppositions. Most importantly, theory selection is fundamentally a normative matter, by way of inference to the best explanation. The criteria for judging theories include ontological parsimony, explanatory adequacy and simplicity, and a unified, coherent, elegant (if possible) theory of the world. Examining the homeostasis theory of death in this context, next to the Aristotelian-Thomistic view of death as the departure of the soul, the comparison is hardly worth making. The homeostasis theory of death is consistent with, coherent with, and/or implied by foundational concepts in modern physiology, gerontology, evolutionary biology, and thermodynamics. It is part of a larger and reasonably unified story of the world, based on a mechanistic explanatory framework that is extremely well accepted in scientific disciplines and their applied counterparts, such as medicine and engineering.

On the other hand, the Aristotelian-Thomistic ontological assumptions about the soul as the “unifying vivifying, organizing principle of a living being”²³ or the rational soul as the “formal principle of the unity and essential identity of the human person”²⁴ are far outside of the modern scientific understanding of the world. We find no appeal to souls, formal principles, formal causes, *teloi*, or other such assumptions in *any* scientific area; neither in human physiology, general cell biology, evolutionary biology, organic chemistry, thermodynamics, mechanics and dynamics, nor any other modern scientific domain. And we surely do not ask our medical students or engineering students to treat disease or design machinery based on a study of the soul or final causes. Thus, when comparing the two theories, the homeostasis theory of death is far superior in terms of coherence and unification with other things that we believe about the natural world. Theories based on Aristotelian-Thomistic metaphysics fail completely in offering any challenge to the homeostasis theory of death, *as a contemporary, scientific, biological theory of death of the human organism* (as opposed to, say, a philosophical theory of death of the person, or a theological perspective on the human soul).

This analysis also clarifies why the challenge that brain dead patients are not “organisms as a whole”, or that the functioning of brain dead patients is not “integrative,” is again no challenge at all. As Lizza correctly notes, these concepts come as part of a package of metaphysical presuppositions; they do not float freely, independent of any background assumptions. But the background framework from which these challenges are posed is the same Aristotelian-Thomistic framework discussed above. It is only *given* the assumptions derived from that

²³ Condic (2016): 264.

²⁴ Moschella (2016): 284.

framework that we get the claim that brain dead patients are not “unified wholes.” It is worth recalling Moschella: “Every living being has one, and only one soul, one substantial form that accounts for the unity, essential identity and integrated functioning of the organism.”²⁵ If we start with Thomistic assumptions about rational ensoulment and so forth, it may (or may not) follow that brain dead patients are not unified wholes. But there is no reason to accept those assumptions in this context, and indeed every reason not to: They are based in ancient physics, ancient biology, and Catholic theology. These are worthy topics of study, but they are not modern scientific biology, so they pose no challenge at all to the homeostasis theory of death; they are not even in the same conversation, frankly. To put it differently, the development of a theory of human death from within a Catholic theological framework is important and interesting, but it is not scientific biology and it should not be advertised or treated as such. It belongs on the other side of Lizza’s bifurcation, as one religion’s perspective on what it means to be a human being, and what it is for a human being to die. And in that regard, the Catholic/Thomistic/Aristotelian view is one among many reasonable perspectives. This brings us to the final section of this commentary, which will be brief.

Beyond Biology: What Interests and Values are at Stake?

Lizza urges a semantic bifurcation of the term “death.” He argues that there are two, temporally distinguishable, real events that may both be characterized with the word “death.” One is death of the organism; the other is death of the person. This is an important distinction to make. Regardless of other questions concerning personhood, the nature of a human being, etc., there is also an important project in the philosophy of biology in developing a characterization of the death of the organism. My arguments in that regard were offered above.

With respect to death of the person, Lizza develops a version of a consciousness-based formulation. When an individual irreversibly lacks the capacity for consciousness and all mental functions, then the psychophysical integration necessary for existence as a human person has ceased, and the person has died. A person can die, however, while leaving behind living remains of the biological organism, such as in the case of brain death or an accurately diagnosed permanent vegetative state. In most cases, though, the person and the organism die at roughly the same time; it is only because of contemporary medical technology that it is now possible for these two events to disassociate.

²⁵ Ibidem: 284.

I will not comment here on the adequacy of Lizza's account of what makes for a human person, or what makes a living organism "one of us" as opposed to no longer being "one of us." Instead, I follow Lizza's lead in emphasizing the social, legal, cultural, and practical context within which this debate takes place. Namely, this debate occurs within the context of medical practice and healthcare systems, specifically involving end of life care, organ procurement, and, rarely, long term care of an unconscious patient. The explicitly moral concepts drawn on in this debate include the ethics of killing and the "dead donor rule" (which prohibits causing death by organ removal), justice in the use of healthcare resources, medical futility, beneficent obligations to provide benefits to those in organ failure, and others. Within that sociopolitical context, a respect for multiculturalism and a pluralism of foundational value systems and worldviews is of critical importance.²⁶ Roughly drawing from the Rawlsian concept of the overlapping consensus, I urge the importance of seeking to develop policy in a way that can achieve an overlapping (but not perfect) consensus in a liberal, democratic society in which we do not all share the same basic worldviews and value systems.²⁷

Questions of what makes us human, or what it is to be a person, are deep, complex, and highly contested issues. They are tied to large-scale philosophical, religious, and culturally embedded worldviews and value systems. Reasonable people can and do reasonably disagree about them. There are many philosophers working within the dominant Western analytic secular philosophical tradition who defend a view of the essential nature of the person in cognitive or psychological terms. There are also philosophers working within the same tradition who defend a view of the essential nature of humanity in biological or organismic terms.²⁸

One might also develop a cogent challenge to consciousness-based views of a person by drawing on broadly feminist ideas. Namely, consciousness-based views of the person arise from a tradition rooted in problematic assumptions regarding the self as hyper-individualist, non-relational, and hyper-rational as exemplified, say, by a Kantian articulation of personhood. In its place, one might endorse a relational, embodied understanding of the self, which cannot be reduced to individual psychology alone but sees the self as embodied and embedded within a web of social, familial, caring relationships. In that case, one could argue that the patient who is apparently irreversibly unconscious but cared for

²⁶ Nair-Collins (2015b).

²⁷ Ibidem.

²⁸ For example, DeGrazia (2005).

long-term by a loving family member remains a member of the human community, remains “one of us,” since that individual remains embodied in the same living human body; and remains embedded within a social, familial context of loving relationships and care.

Furthermore, it is somewhat easy within the Western analytic tradition to embrace some version of a consciousness-based formulation of personhood and death. This is because the tradition is heavily dominated by Cartesian dualism which splits the mind and the body, as well as a very long-standing (over-)emphasis on rationality or at least sentience as engendering moral worth. The cultural traditions of Japan, however, yield a different suite of moral and ontological ideas. Quoting Lock:

[Japanese doctors do not] habitually make stark mind/body distinctions [in the way that North American doctors do]. Japanese indigenous medical knowledge holds that life is diffused throughout the body in the substance of *ki* (*ch'i*, in Chinese), and it is assumed on this basis that most Japanese are not willing to equate a permanent loss of consciousness with death [...] ‘person’ is not usually understood as an autonomous entity firmly encased inside a brain [...] an individual is understood as residing at the centre of a network of obligations, so that personhood is constructed out-of-mind, beyond body, in the space of ongoing human relationships.²⁹

Similarly, while there are plausible interpretations of most religious worldviews that justify brain death as death, there are also plausible interpretations of most religious worldviews that oppose brain death as death. For example, brain death has been challenged from the religious perspectives of Buddhism, Shinto, Confucianism, Taoism, Judaism, Catholicism, and Islam.³⁰

When developing criteria for legally determining death for the purposes of organ transplantation, end of life medical care, and so on, we must attend to the cultural and social context within which these questions are asked. But we live in a global, diverse, multicultural world, within which a pluralism of ideas about such deep questions can and ought to be accepted as a matter of public policy. As a matter of science, brain dead patients are biologically living. As a matter of morality, culture, and religion, some people very reasonably argue that they are, in a meaningful (but not biological) sense, already dead. Or that they are not “one of us.” Other people, also very reasonably but perhaps starting from different as-

²⁹ Lock (2004): 148–149.

³⁰ Nair-Collins (2013): 84.

sumptions, a different worldview, or a different cultural context, argue that they are still alive, that they are still “one of us.” Importantly, I am not arguing from disagreement to the conclusion that there is no “fact of the matter,” nor for any kind of relativism. Instead, this is a plea for epistemic, moral, and cultural humility; along with a commitment to some of the deep ideas that *are* firmly entrenched within the Western tradition of liberal individualism. Namely, this is not a matter for us to impose on each other. Individual persons (via advance directives), or their families, are the most familiar with the patient’s culture, values, and religious or philosophical worldview, and thus are in the best position to decide what ought to be done, and whether the living body is “one of us,” in such a tragic situation as brain death.

Finally, using the term “death,” without any clarification, to mean “ceasing to exist of the person even though the body remains biologically alive” is confusing and misleading. As I have argued elsewhere, this frustrates informed consent for organ donation, legitimate democratic deliberation about fundamentally normative policy matters,³¹ and it can even harm and wrong organ donors.³² Thus I would urge greater clarity in use of language, namely by acknowledging explicitly that the brain dead patient is biologically alive, but it is a more personal and family matter to decide if that means the person or human being has died, or not.

Conclusion

Professor Lizza has long offered searching and trenchant critiques of the dominant biological paradigm of death. These critiques have helped to advance our understanding of death. In particular, his argument that concepts of death, even biological concepts of death, are not free of normative assumptions, is well-taken. However, this does not show that the project to develop a rigorous biological theory of death of the human organism is confused or doomed. Instead, careful attention to those underlying normative and ontological assumptions allows us to see more clearly the evaluative criteria we ought to use in pursuing that project. Finally, on the other side of the semantic bifurcation, the death of the person, I argue that this is a matter about which reasonable people can reasonably disagree, and it is not a matter about which only a single intellectual and cultural tradition should dominate. Instead, the embrace of multiculturalism and of diversity suggests that we ought to allow for a pluralism of concepts on what it is to be a hu-

³¹ Ibidem.

³² Nair-Collins (2017).

man being, or a human person, and what it means for a human person to cease to exist.

References

- Banfalvi G. (1991), "Evolution of Osmolyte Systems," *Biochemical Education* 19 (3): 136–139.
- Brock D. (1987), "Truth or consequences: the role of philosophers in policy-making," *Ethics* 97 (4): 786–791.
- Condic M.L. (2016), "Determination of Death: A Scientific Perspective on Biological Integration," *Journal of Medicine and Philosophy* 41 (3): 257–278.
- DeGrazia D. (2005), *Human Identity and Bioethics*, Cambridge University Press, Cambridge.
- Hall J.E. (2016), *Guyton and Hall Textbook of Medical Physiology*, 13th ed., Elsevier, Philadelphia.
- Khan S.S., Singer B.D., Vaughan D.E. (2017), "Molecular and physiological manifestations and measurement of aging in humans," *Aging Cell* 16 (4): 624–633.
- Lakatos I. (1970), "Falsification and the methodology of research program," [in:] *Criticism and the Growth of Knowledge*, I. Lakatos, A. Musgrave (eds), Cambridge University Press, Cambridge.
- Lizza J.P. (2006), *Persons, Humanity, and the Definition of Death*, The Johns Hopkins University Press, Baltimore (MD).
- Lizza J.P. (2018), "Defining Death: Beyond Biology," *Diametros* 55: 1–19.
- Lock M. (2004), "Living cadavers and the calculation of death," *Body & Society* 10 (2–3): 135–152.
- Moschella M. (2016), "Deconstructing the brain disconnection-brain death analogy and clarifying the rationale for the neurological criterion of death," *Journal of Medicine and Philosophy* 41 (3): 279–299.
- Nair-Collins M. (2013), "Brain Death, Paternalism, and the Language of 'Death,'" *Kennedy Institute of Ethics Journal* 23 (1): 53–104.
- Nair-Collins M. (2015a), "Taking Science Seriously in the Definition of Death," *Hastings Center Report* 45 (6): 38–48.
- Nair-Collins M. (2015b), "Laying Futility to Rest," *Journal of Medicine and Philosophy* 40 (5): 554–583.
- Nair-Collins M. (2017), "Can the Brain-Dead Be Harmed or Wronged? On the Moral Status of Brain Death and its Implications for Organ Transplantation," *Kennedy Institute of Ethics Journal* 27 (4): 525–559.
- Nair-Collins M., Miller F.G. (2017), "Do the 'Brain Dead' Merely Appear to be Alive?" *Journal of Medical Ethics* 43 (11): 747–753.
- Popper K. (1963), *Conjectures and Refutations*, Routledge & Kegan Paul, London.
- President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research (1981), *Defining Death: A Report on the Medical, Legal and Ethical Issues in the Determination of Death*, U.S. Government Printing Office, Washington (DC).
- President's Council on Bioethics (2008), *Controversies in the Determination of Death: A White Paper by the President's Council on Bioethics*, U.S. Department of Health and Human Services, Washington (DC).