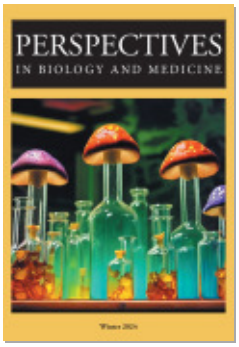
Organismal Superposition and Death

Michael Nair-Collins



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In the Winter 2024 article by Michael Nair-Collins, “Organismal Superposition and Death,” (volume 67, number 1, pages 22–30), the title of one of articles in the References list was incorrect. Perspectives in Biology and Medicine regret this error. Click here for the updated PDF.

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Organismal Superposition and Death

Michael Nair-Collins

ABSTRACT Organismal superposition holds that the same individual both is and is not an organism, as a consequence of organismal pluralism. When coupled with the assumption that death is the cessation of an organism, this entails that there is no unique answer as to whether brain death is biological death. This essay argues that concerns about organismal pluralism and superposition do not undermine a theory of biological death, nor entail any metaphysical indeterminacy about the biological vital status of a brain-dead individual.

Piotr Nowak (2024) argues that there is an "organismal superposition problem" for a biological theory of death. Death is the ceasing to exist of an organism, but there are multiple valid concepts of organism in theoretical biology, and they yield different results as to whether a brain-dead patient is an organism or not—that is, whether or not the patient continues to live. Thus, the same patient is both alive and dead, an organism and a former organism, simultaneously, and this undermines any attempt to ground social policy on death determination in biology. Instead, Nowak argues, death should be defined in terms of moral status, where an individual has moral status when direct obligations are owed to

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them, or when they have conscious affective states that render them capable of valuing things. Since brain-dead patients are permanently unconscious, they lack affective states, are incapable of valuing, and no direct obligations can be owed them. They are dead.

Nowak, as well as Adrien Stencel (Nowak and Stencel 2022), have made important contributions to the literature on death, with thoughtful analyses of the concept of organism and its role in explaining death. Greater engagement with general philosophy of science and philosophy of biology is certainly illuminating, and their work has added important nuance and opened fruitful lines of inquiry—no small achievement in a dense and saturated literature, I might add. Though this was not their intention, the main takeaway that I see from Nowak's and Stencel's writings on organism is to expose confusion in the brain death literature on this topic, and in so doing, to clarify why, *pace* Nowak and Stencel, the concept of organism is not as important for explaining death as one might assume.

Nowak's and Stencel's Argument

It is commonly assumed that death is the ceasing to exist of an organism. The idea that the organismic status of the brain-dead patient should inform our conduct toward them has also been influential (Nowak 2024). Assuming this view, an explanation of the nature of an organism is required, since the vital status of the brain-dead patient turns on their organismic status. If the brain-dead individual is no longer an organism, or an organism as a whole, then they have died, even though parts of the organism may continue to live, as supported by technology.

This influential view is grounded in the background assumption that death is a matter of biology or physiology, not a social choice, assessment of moral status, or ontological theory of personhood. As the explanation of death is meant to be grounded in biology, characterization of the critical concept of organism must also be grounded in, and accountable to, theoretical biology. And according to Nowak and Stencel, this is where things go wrong.

In philosophy of biology, organismal pluralism is the dominant view. It holds that there are multiple equally valid concepts of organism. While there could be many such concepts, depending on how we individuate them, there are four main kinds of organism concept found in the theoretical biology literature: developmental, functional developmental, immunological, and evolutionary (Nowak 2024). An organism is the individual entity that proceeds from a fertilized egg, or from ovum to ovum, on the developmental view. The functional developmental view is the same, but also requires that individual to be functionally integrated to be an organism. The immunological view does not emphasize development, but the presence of immunological responses: to be an organism, an individual entity must respond with hostile immunological responses to everything that is not itself, and not react in this way to its own parts. On the evolutionary concept, an

organism is capable of reproduction and participates in natural selection through reproduction.

When considering the individual who is brain dead, Nowak argues that superposition applies: the patient is both dead and alive. On the functional developmental concept, although the individual meets the requirements of the developmental view as having developed from a fertilized egg, plausibly, the individual lacks "proper integration" (Nowak 2024, 3, citing Moschella 2016), so on this view the individual is not an organism. Brain-dead individuals are capable of immune responses, so they are organisms on the immunological view. The evolutionary concept is more complex, since there are several versions of it, though it is meant to capture the notion of a unit that participates in evolution by natural selection. The classic version defines an organism as an evolutionary individual, or one capable of producing offspring. This concept applies to some brain-dead individuals, since pregnant females can gestate fetuses, viable sperm can be retrieved from brain-dead males, and presumably, assisted reproduction techniques could be successful in impregnating a brain-dead female. Since these concepts are equally valid, and jointly entail that the brain-dead individual both is and is not an organism and hence, is both living and dead, we have a superposition problem. There is no biologically justified answer as to whether brain death is death.

DEAD ORGANISMS

Assume that Nowak and Stencel have been successful in their critique. This would show that a theory that identifies death with the cessation of an organism is unsuccessful. It would not show that all biological theories of death are unsuccessful. The organismal superposition problem is not even relevant unless we begin with the premise that death is the cessation of an organism. Is this premise required for a theory of death? It depends, and this point draws out a key semantic ambiguity.

If there are dead organisms, then organisms do not cease to exist when they die. Rather, they transition from being living organisms to being dead organisms, ceasing to exist only at some later time. In a recent paper in *Nature Reviews Microbiology*, Noah Sokol and colleagues (2022) describe some of the many complex processes that take place within the soil microbiome, with a focus on "how the biogeochemical cycling of organic matter depends on both living and dead soil microorganisms, their functional traits, and their interactions with the soil matrix and other organisms" (415). Yusuke Muramiya and colleagues (2022) describe how dead organisms, such as bivalves and ghost shrimp, serve as a carbon source for the development of glendonite, a type of mineral. They title their paper "Glendonite Concretion Formation Due to Dead Organism Decomposition." These authors use "dead organism" without any loss of meaning or clarity, and

there is no obvious contradiction here akin to "round square." This is a perfectly reasonable use of the term *organism,* and it undercuts the idea that an organism ceases to exist when it dies.

However, Nowak does not accept this usage, preferring to restrict *organism* to specifically mean *living organism*. On this meaning, it is a matter of definition that organisms cease to exist when they die. "I do not think dead organisms exist," he writes: "one of the dictionary's meanings of *death* is a 'permanent end of something' . . . strictly speaking the phrase 'dead organism' means 'the former organism'" (Nowak 2024, 4). Hence, Nowak would argue that the uses of *organism* in the previous paragraph can only be metaphorical or imprecise. Strictly speaking, and to avoid uncharitable attributions of self-contradiction on the part of these authors, we must reinterpret the sentences by replacing "dead organism" with "former organism."

I do not have a position on the correct use of *organism,* because it is a mere semantic dispute. It seems unobjectionable to say, for example, that detritus is partly composed of dead organisms. But if it is preferable to call them "former" organisms instead, that's fine, too. This harmless semantic ambiguity sheds no light on the nature of death.

However, it does become important for the organismal superposition charge, since that critique is entirely built on the premise that biological death is the cessation of an organism. On what grounds should we accept that premise? If the answer amounts to a stipulation that "dead organism" is a contradiction, then the argument is very weak: it is a mere tautologous stipulation. If there is any justification for assuming that death is the cessation of the existence of an organism, a semantic argument about acceptable uses of *organism* doesn't provide it.

Differences Between the Concepts of Organism and Death

Although they are related, the concepts of organism and death are importantly different. *Organism* is a taxonomizing and individuating concept. It groups things in the world together, and differentiates one thing from another. But the concepts of being alive and being dead are primarily descriptive, characterizing the state or condition of some individual. The taxonomic function of these latter concepts—grouping dead things apart from living things—is derivative on the primary descriptive function. Death—the natural phenomenon, not the word—is something that happens to an organism, or it is something the organism goes through. An explanation of death presupposes that there is some individual entity, often an organism but not necessarily, and attempts to elucidate what happens when that individual transitions from one kind of state—being alive—to that of being dead.

To illustrate the difference between concepts of organism and death, consider a meadow of aphids, where many individuals all developed from the same egg.

They all have the capacity to reproduce, so are considered distinct organisms on the evolutionary view. If they were sprayed with a pesticide that rendered them infertile, though they continued to eat and move, then the evolutionary concept would say none of them are organisms anymore, due to their inability to reproduce. But if someone were to step on a handful of them and not others, the handful that got stepped on would die, while the others would not. Their reproductive status is quite beside the point of whether each individual aphid is alive or dead. The developmental concept would consider the whole collection to be one organism, since they developed from the same egg. So, the organism would continue to exist after a few were stepped on. This is small consolation for those who are about to be crushed, because they will die, quite apart from their ontological participation in the broader entity.

Nowak (2024) uses this example to illustrate how different concepts of organism might apply to the single case of aphids in a meadow. Whatever the merits of organismic pluralism as a more general matter, what the example shows most clearly is that *organism* and *death* come apart. If I am interested in whether a particular aphid is living or not, it is not helpful to tell me its reproductive status, nor whether it has, as in this case, several thousand "identical twins." The organismic status of one individual aphid, according to one or another theory of organism, does not determine whether it is alive or not. A fortiori, neither the developmental, functional developmental, immunological, nor evolutionary concepts of organism, nor organismal pluralism, determine whether an individual human patient on a ventilator is alive or not. For that, a theory of death is needed.

ORGANISMAL PLURALISM

Organismal pluralism is not a simple, or even a single, view. While discussion of scientific pluralism as a general matter is far beyond the scope of this comment, there are a few key points to note.

As mentioned above, the concept of organism individuates one thing from another, and offers a taxonomy of things. In general, issues surrounding classification, taxonomy, and explanation are complex, but a basic point is that there are near endless possible ways of slicing up the world into individuals, kinds, and taxonomies. The difference between a realist or constructivist or pragmatist on these categories is in how they interpret them, not in whether there are multiple ways to individuate and categorize things. In terms of the concept of organism, there are different explanatory aims and contexts, which can usually be tied to different disciplinary concerns. The study of immunology has different aims and methods than that of evolutionary biology, although they interrelate. These distinct perspectives generate different kinds of explanations, emphasizing different mechanisms and levels of explanation, with the goal of explaining different phenomena. The concepts and theories that result from these disparate kinds of

study may result in different ontologies—that is, the objects or entities that the theory claims to exist, including apparently incompatible claims about what an organism is.

Epistemic pluralism merely claims that multiple concepts of organism are sufficiently well justified to merit acceptance and further theoretical engagement. It does not make an ontological claim. Explanatory pluralism holds that the different ontologies posited by well-supported explanations from different explanatory contexts are both useful and justified in positing and, depending on the background metaphysics (for example, realism or not), might also claim that the objects in these ontologies exist. Ontological pluralism straightforwardly makes the ontological claim that the different entities posited by the different theories or concepts exist.

These might result in "competitive" or "compatible" pluralisms. For an example of the latter, we might have multiple apparently competing concepts that are part of explanations at different levels, and so aren't competing. There can also be realist or anti-realist interpretations of all these concepts, where an anti-realist might claim that the individuals, kinds, or taxonomies are social constructions and not mind-independent entities, while the realist claims that the entities quantified over by mature, well-supported scientific theories exist, and do so mind-independently.

Critically, what the various interpretations of organismal pluralism share is an attention to different explanatory contexts, such as immunology or evolutionary biology. No version of organismal pluralism claims that the different concepts are justified independent of the explanatory context that gives them both content as well as epistemic justification. Regardless of the possible interpretations of pluralism, the idea is precisely that different contexts of explanation yield different concepts of organism.

Pluralism is fundamentally a philosophical response to the variety of theories and ontologies *across* explanatory contexts. It is partly a rejoinder to reductionism, which seeks to find "bridge theories" connecting the ontology of different disciplines and ultimately reduce all ontology to that of physics. But organismal pluralism does not imply that several different concepts of organism are equally valid or equally well supported *within the same explanatory context*. For example, the explanatory context of evolutionary biology—its aims, methods, levels of explanation, and ultimately its theories—is precisely what gives content to the evolutionary concept of organism and provides epistemic justification for positing organisms as described by its theories.

Therefore, the claim that different concepts of organism are equally valid across different explanatory contexts does not yield the conclusion that different concepts of organism are equally valid *within the same explanatory context*. The allegation of organismal superposition in a biological explanation of death, however, makes precisely the latter claim, which is unsupported by organismal pluralism. In other words, organismal pluralism does not entail organismal superposition.

BRAIN DEATH AND CONCEPTS OF ORGANISM

Nowak and Stencel argue that multiple concepts of organism apply, with equal validity, to the case of brain death. This is not the case. To see why, it is important to examine what these concepts imply in cases that are not brain death. If a concept of organism entails that a living, non-brain-dead human is not an organism, then it is either incorrect or does not apply to the explanatory context of human medicine and physiology. Since we must accept the premise that death is the cessation of an organism in order for organismal superposition to have any relevance to a theory of death, then if a concept of organism entails that an individual is not an organism, it also entails that that individual is dead. If a concept of organism entails that a living individual is dead, then it is false or not applicable in the explanatory context of human medicine and physiology.

The evolutionary view emphasizes the capacity for reproduction. Some humans have difficulty with fertility but can produce offspring through "scaffolded reproduction," in which assisted reproduction techniques can be used. But some humans cannot reproduce even with assisted reproduction. If the evolutionary view entails that a healthy person who happens not to have the capacity to produce children is not an organism, and is thereby dead, then the evolutionary view of an organism is either false or not applicable in this explanatory context.

The immunological view requires certain kinds of immunological responses, and the lack of others. In some cases, such as a bone marrow transplant or in cancer treatment, total body irradiation is used to suppress the immune response. Patients with this kind of treatment are extremely vulnerable to many infections due to a severely suppressed immune system. In other cases, there are many kinds of autoimmune disease, in which the immune system attacks what it should not—namely, parts of the organism itself rather than invading pathogens. If the immunological concept of organism entails that an otherwise living but severely immunocompromised person, or a person with autoimmune disease, is not an organism and therefore is dead, then the immunological concept is false or does not apply in this context.

Identical twins develop from the same fertilized egg, and therefore the developmental view implies that they are a single organism. If the developmental view implies that both of a pair of twins must die for the organism to die, and conversely that if only one twin dies then his or her organism hasn't died—since only a part of the organism is lost yet the organism as a whole remains—then the developmental view is false or not applicable in this context.

If these three concepts of organism, together with the premise that death is the cessation of an organism, entail that living people are dead, or have other false entailments, then they cannot be validly applied to explain organism status in these cases where people are not brain dead. And if they cannot be validly applied in contexts outside brain death, then they cannot be validly applied in the brain death context either.

Of the four families of views of organism that Nowak discusses, we have just ruled out three—and thus, organismal pluralism along with them. The functional developmental view is the only one remaining.

On this view, the question of whether the brain-dead patient is an organism turns solely on whether there is integrated functioning remaining, since the "developmental" portion of the theory is clearly satisfied. Does integrated functioning continue in patients who are brain dead? For this question, I refer the reader to the brain death literature, as this question has occupied scholars for decades. For my purposes here, there is no need to adjudicate it. The most relevant points are that, first, organismal pluralism does not entail organismal superposition. Second, there is only one theory of organism left and so there is no organismal pluralism. And third, if we assume the functional developmental view for the sake of argument, then whether the brain-dead patient is an organism is a function of the very same question that much of the brain death literature has grappled with for a long time—namely, what kind of functioning is present in the brain-dead body and what it means for the vital status of the patient.

There are different views on the question of whether integrated functioning remains in brain death, or rather, if it is the "right kind" of, "enough," or "proper" integration. Should we take the fact of disagreement to mean pluralism about death, as well? No. We should take it to mean that people disagree about whether brain-dead patients are alive or not. This is hardly a surprising result, and it certainly does not entail that all views are equally valid or well-supported.

Conclusion

This essay is primarily intended to respond to the challenge of organismal superposition. Any one of the above responses undercuts the view, but taken collectively, I consider them decisive. Organismal pluralism, and organismal superposition, do not defeat a theory of biological death. And from that perspective, brain-dead patients are biologically living.

I want to make one simple point about policy. Social policy about death determination is a political issue, not a moral or ontological one. The dominant Western worldview that sees mind, personhood, or human identity as in some way distinct from the organic body, or that roots moral value in either reason or consciousness, is a perfectly acceptable foundation and justification for anyone's personal medical decisions. And so are other worldviews. At least in the context of personal medical decisions, it is not acceptable to force the implications of one's philosophical or religious worldview onto those who do not share it. The question of policy is not which theory of moral status, or which theory of personhood or human identity is best. The question is what sort of policy is just and respectful of different cultural and religious traditions and worldviews. For that question, advocating that a single view of moral status or personhood

is the most well supported at best misses the point and at worst facilitates unjust coercion. The brain-dead patient is a living human body. What that living body means in terms of human identity, moral value, social relationships, religious commitments, and so on, is not for me or anyone else to impose on others; the final say on treatment decisions must be deferred to the family that is confronted by tragedy. Coerced treatment withdrawal in brain death should cease. Those who reject the idea that brain death is death deserve respect that is manifested in policy and practice.

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