

Defining ‘Dead’ in Terms of ‘Lives’ and ‘Dies’

Cody Gilmore

Received: 22 February 2007 / Revised version received: 27 April 2007 / Accepted: 7 May 2007 /

Published online: 21 June 2007

© Springer Science + Business Media B.V. 2007

Abstract What is it for a thing to be dead? Fred Feldman holds, correctly in my view, that a definition of ‘dead’ should leave open both (1) the possibility of things that go directly from being dead to being alive, and (2) the possibility of things that go directly from being alive to being neither alive nor dead, but merely in suspended animation. But if this is right, then surely such a definition should also leave open the possibility of things that go directly from being dead to being neither alive nor dead, but merely in suspended animation. I show that Feldman’s own definition of ‘dead’ (in terms of ‘lives’ and ‘dies’) does not leave this possibility open. I propose a new definition that does.

Keywords Death · Dies · Dying · Dead · Life · Living · Alive · Lives · Suspended animation · Definition · Conceptual analysis · Feldman

Introduction

In *Confrontations with the Reaper* and a series of related papers,¹ Fred Feldman offers a painstaking discussion of attempts to define the following locutions (or the concepts expressed by them):

- (1) ‘x is *alive* at t’,
- (2) ‘x *dies* at t’,
- (3) ‘event e is a *death*’,
- (4) ‘x is *in the process of dying* at t’, and
- (5) ‘x is *dead* at t’.

Feldman assumes that any adequate definition of ‘is a death,’ ‘is in the process of dying,’ or ‘dead’ will need to appeal to ‘dies,’ and that any adequate definition of ‘dies’ will need to appeal to ‘lives.’

¹See Feldman 1989, 1992a,b, 1998.

After considering a broad range of proposals, he concludes that ‘lives’ resists definition. Nevertheless, he thinks we understand this locution well enough to make it worthwhile to try to use ‘lives,’ taken as primitive, to define ‘dies.’ Likewise, although he eventually admits defeat in the attempt to define ‘dies’ in terms of ‘lives,’ he thinks that we understand *both* locutions well enough to make it worthwhile to use them, taken as primitives, in an attempt to define locutions (3)–(5).

In particular, Feldman’s (1989) paper, “On Dying as a Process,” is entirely devoted to formulating and defending an analysis of *dying*₂, the concept expressed by the locution ‘x is in the process of dying at t.’ He regards this analysis as being less than fully informative (since it appeals to closely related concepts that he is forced to take as primitive) but still valuable:

It should be clear that this proposed analysis of *dying*₂ makes essential use both of the concept of death and of the concept of life...Since life and death are enigmatic, so is *dying*₂. In light of all these difficulties, I think it must be admitted that the concept of *dying*₂ is a bit of a mystery. Nevertheless, I think my proposed analysis is an advance over earlier suggestions. I think it at least has the merit of revealing the outlines of the concept of *dying*₂ and showing how it relates to some other concepts in the vicinity. It also has the merit of revealing and locating some of the more obscure conceptual components of the concept of *dying*₂. (Feldman 1992a: 86)

In this paper I pursue an analogous project – that of defining ‘dead’ in terms of ‘lives’ and ‘dies.’ The virtues and vices of my analysis are parallel to those that Feldman attributes to his analysis of ‘is in the process of dying.’ Since my analysis appeals to primitives that are closely related to my target and that are themselves somewhat puzzling, the analysis is not as informative as one might initially hope. But it does bring to light certain important facts about the structure of its target concept, and it clarifies the relationship between that concept and those expressed by ‘lives’ and ‘dies.’ In particular, it shows that any obscurity that may be associated with ‘dead’ ultimately has its origin elsewhere.

It may be worthwhile to be explicit about my reasons for declining to offer definitions of ‘lives’ and ‘dies.’ First, the project of formulating such definitions is too large for a single paper, not to mention a paper whose primary focus lies elsewhere. Second, regardless of space constraints, I simply do not know *how* to define either ‘lives’ or ‘dies,’ nor do I have much to add to Feldman’s discussion of attempts to define them. I agree that these concepts resist analysis, and for roughly the reasons he gives.² Third, I think that a definition of

²Briefly, my reasons in the case of ‘dies’ are as follows. (The discussion of ‘lives’ resists brief summary.) According to what Feldman dubs the *standard analysis*, to die at t is to cease to be alive at t. This analysis faces two main problems.

(1) When a living thing enters suspended animation, it’s arguable that it does cease to be alive but it doesn’t die. Eventually Feldman tentatively endorses the following repair: “x dies at t=df. (a) x ceases to be alive at or before t, and (b) at t, internal changes occur in x that make it physically impossible for x ever to live again” (1992b: 172). But (contrary to what Feldman appears to think) it seems that a thing can die at a time without satisfying clause (b). Consider any tree that is still standing but that has clearly died. No doubt the tree lacks any disposition to live, and it is extremely improbable that it ever lives again. But is it physically *impossible*? This is doubtful. The sentence “This tree has died but it is physically possible for the tree to live again; there is a nomically possible world that duplicates the actual past and present and in which this tree lives in the future” does not strike me as analytically false. So the repair seems unsuccessful, and no adequate alternative suggests itself.

(2) In a case of ‘terminal biological fission’, a living thing ceases to exist and ceases to be alive by dividing into some other living things. Feldman suggests that in some cases of terminal biological fission the thing involved seems to die, whereas in other cases it does not. (When an amoeba undergoes fission, Feldman thinks, it ceases to exist and thereby ceases to be alive but does not die. However, a mouse *does* die when it is sent through a ‘cell-separator’ that emits a puree of living mouse cells.) Absent some principle for distinguishing between deathless and deadly cases of terminal biological fission, a definition of ‘dies’ remains elusive.

‘dead’ in terms of ‘lives’ and ‘dies,’ even if it wouldn’t answer *every* question that we might ask about death, is still worth pursuing. After all, questions about the nature of death are of long-standing concern. The concept expressed by ‘dead’ is *prima facie* quite relevant to moral theory and is important in various domains outside philosophy. Thus it seems to me that even incremental progress in our understanding of this concept is significant.

Preliminaries

Let me begin by offering a rough and intuitive characterization of the concepts that will figure in my discussion.

‘*x is alive at t*’. To say that a thing is alive at a time *t* is, very roughly, to say that it is performing a sufficient number of life-functions (“metabolism ... motion, energy transfers, syntropic increase in orderliness, etc.”)³ at *t*. The concept of being alive that will concern me here is not one that applies only to people or only to members of the species *Homo sapiens*; it is, rather, a more general concept that applies univocally across a very wide range of biological entities. I take these to include plants, single-celled organisms such as bacteria, and even individual cells (such as my neurons) that may not be organisms in their own right. Clearly, then, ‘lives’ must not be defined in such a way as to require that living things be *conscious* or in possession of a properly functioning brain.

Similar remarks apply to all of the concepts that follow: the concepts that I will be concerned with are ones that apply univocally to a wide range of biological entities, and so they must not be defined in such a way that they turn out to apply only to humans.

‘*x dies at t*’. In ordinary circumstances, a thing dies at a time *t* just in case *t* is the instant at which the thing makes the transition from being alive to being dead. (Of course, it will often be a vague matter as to whether an organism dies at instant *t* rather than at some neighboring instant *t**.) It is important to distinguish between, on the one hand, saying that a thing dies at *t*, and on the other hand, saying that it is in the process of dying at *t*. A thing can be in the process of dying at *t* even if it unambiguously remains alive (and unambiguously does *not* begin to be dead) for a fairly long stretch of time following *t*. It cannot *die* at *t* unless it begins to be dead at *t*.

‘*x is dead at t*’. Being dead, I will assume, is incompatible with being alive: nothing can be dead and alive at the same time. In ordinary circumstances, a thing is dead at a time *t* just in case it died at some earlier time (or perhaps at *t* itself). Indeed, each of the analyses of ‘dead’ that I will consider entails that having died is at least a *necessary* condition for being dead. (According to one analysis, it is also sufficient.) To see the significance of this assumption, suppose that *A* is a tree that died and is decomposing, and that *B* is an object that never lived or died, but rather that came into existence in its present condition just a few seconds ago. Then, given the relevant assumption, *A* is dead and *B* is not, even if *A* and *B* are molecule-for-molecule duplicates at the present time.

I take it, then, that being dead is not an *intrinsic* property. To say that a property *F* is intrinsic is, roughly, to say that whether or not a thing has *F* at a time *t* depends only on what the thing is like in itself at *t*, and is independent of both (1) how the thing is related to things outside itself at *t* and (2) how things are at other times.⁴ Since being dead is at least

³Feldman 1992b, p. 170.

⁴See Weatherson 2004 for a survey of the literature attempting to clarify the notion.

partly a matter of having died, it is at least partly *historical*, and hence not intrinsic. Moreover, the distinction between the living and the dead is far from exhaustive. All ordinary inanimate objects such as rocks and toothbrushes are neither living nor dead.

'*x is in suspended animation at t*'. As Feldman notes, it is routine procedure in biology laboratories to put micro-organisms (among other things) into a state of suspended animation. This is done by coating the organism in some cryoprotectant chemical and then cooling it to a temperature of -196 degrees Celsius. The organism can be stored for long periods of time in this condition and revitalized by being gradually warmed. It is uncontroversial that such organisms are alive both before they are cooled and after they are revitalized. But what is their status while in suspended animation? Are they dead? Alive? Neither dead nor alive?

First consider the claim that these organisms are *not dead*. This claim is supported by two related facts about these organisms: (1) that their internally grounded *dispositions* or *capacities* to engage in the relevant life-functions are perfectly intact and undamaged, and (2) that the organisms can be revived relatively easily, even without being in any way repaired.⁵

Next consider the claim that organisms in suspended animation are *not alive*. This is supported by the fact that all of their life-functions have been halted. For what it's worth, this view seems to be quite popular. It is held, e.g., by the well-known biologist John Maynard Smith (1986):

The maintenance of a living state requires a constant flow of energy through the system. A freeze-dried insect is not alive: it was alive, and may be alive again in the future. Energy must be supplied in either the form of suitable chemical compounds or as sunlight, and in either case atoms are continuously entering and leaving the structure of the organism. (p. 2)⁶

And here is the philosopher of biology Jack Wilson (1999):

Under special circumstances a living entity can persist through the loss of its life. The type of cases that I have in mind are ones in which a biological entity has been put into stasis or otherwise preserved and then later revived. It seems appropriate to describe a case like this as one in which an entity was alive, was not alive, and then was alive again while remaining numerically the same thing ... My concern for this topic is primarily derived from the forms of stasis that preserve the structures of a living organism intact or in restorable form, but prevent those structures from functioning ... Freezing and equivalent forms of stasis are particularly attractive

⁵This case for the conclusion that such organisms are not dead differs somewhat from Feldman's case. Speaking of these organisms, he says, "... since they can return to life again later, it seems that they have not died." (Feldman 1998: 819). Here, Feldman seems to suggest that the mere fact that something is such that it is *possible* for it to live later (presumably, compatible with the conjunction of the actual laws of nature and a complete description of the actual past and present) entails that the thing is not currently dead. This argument, on the other hand, supports the conclusion that O is not dead by appeal to the fact that O's internally-grounded dispositions to engage in life-functions are fully intact and that O could be revived *so easily*, and without first being repaired. As to the suggestion that it is physically impossible for dead things to return to life, I find this highly implausible, for reasons mentioned in note 2. Elsewhere, Feldman is very explicit about his wish to remain *neutral* as to the possibility of dead things returning to life: "So far as I can tell, none of the principles or definitions so far introduced here entails either than life after death is possible or that it is impossible. I find myself without clear intuitions on the question, and accordingly I shall not commit myself" (Feldman 1992a: 113).

⁶Hoffman and Rosenkrantz (1997: 158, 208), who also quote the passage, concur.

candidates for preserving identity without continued life. Freezing makes the body a nonmetabolic object. (p. 101)

Wilson (1999) cites the example of microscopic aquatic animals called *tardigrades*. Some tardigrades can, in his words, “survive freezing” and “survive complete dehydration or anhydrobiosis” (p. 101).

The case for holding that organisms in suspended animation are not dead is perfectly compatible with the case for holding that they are not alive. Perhaps, then, we should conclude that these organisms are neither dead nor alive. Feldman (1992b), following Wreen (1987),⁷ advocates exactly that conclusion:

Organisms that enter suspended animation cease to live, but do not then die ... We must define death in such a way that it turns out that organisms that enter suspended animation don’t die. (p. 170)

[Organisms in suspended animation] are ... neither dead nor alive. As I see it, suspended animation is a state that excludes both life and death. (p. 171)

It seems to me that this view is sufficiently plausible that we should be dissatisfied with any definition of ‘dead’ that rules it out.

Note that I am not claiming that the Wreen–Feldman view (that organisms in suspended animation are neither alive nor dead) is *true*, much less that it should somehow be built into a definition of ‘dead.’ As it happens, I think that we should also be dissatisfied with any definition of ‘dead’ that rules out the either of the following possibilities: (1) that organisms in suspended animation are dead, or (2) that organisms in suspended animation are alive. Questions about the vital status of organisms in suspended animation should be *left open* by definitions of ‘dead.’

Against D1

Jay Rosenberg (1998) claims that ‘dead’ can be defined in a very simple way by appeal to ‘dies’:

‘Aunt Ethel is dead’ ... seems to say just what ‘Aunt Ethel has died’ says ... To say that a person is dead, then, seems ... to report on a past event rather than a present condition ... ‘Being dead,’ as we customarily speak, picks out only the ‘nominal condition’ of having died. (pp. 42–43)

Rosenberg’s remarks seem to suggest this definition:

D1 x is dead at t = df. x died at some time earlier than t .

In the following passage, Feldman (1992a) objects to D1 and offers what he takes to be an adequate repair:

It may at first appear that we can define ‘dead’ straightforwardly by appeal to ‘dies’ as follows:

D1 x is dead at t = df. x died at some time earlier than t .

⁷Wreen (1987: 89) writes that “suspended animation is a state not readily assimilated to either life or death.”

But suppose it is possible for something to live again after death; suppose that genuine revitalization is possible. In such a case, D1 would force us to say that the revived entity is at once living and dead. It would be living because it has been revitalized; it would be dead according to D1 because it died at some earlier time. This seems wrong to me. It seems to me that once it has been revived, such an organism would no longer be dead. It would then simply be alive again. Therefore I prefer to define ‘dead’ in this way:

D2 x is dead at t = df. x died at some time earlier than t , and x has not been alive since then.⁸

So the concept of being dead can be defined by appeal to the concepts of dying and being alive, together with the concept expressed by ‘earlier than.’ (p. 108)

Feldman is dissatisfied with D1 because it generates absurd consequences when applied to cases involving revitalization. It is important to note, however, that one can accept this reason for being dissatisfied with D1 even if one is not positively committed to the metaphysical possibility of revitalization. After all, even those who firmly deny this possibility will presumably admit that the sentence

(S) There is a thing that died at some earlier time but that is alive, not dead, at the present time,

is not *analytically false*. But unless (S) is analytically false, D1 fails to capture the meaning of ‘dead.’

Moreover, it may be worth pointing out in this context that the case against the metaphysical possibility of revitalization is highly controversial at best. (Other things being equal, it is preferable to define ‘dead’ in a way that leaves substantive metaphysical questions *open*; such definitions should aim at being *neutral* with respect to substantive metaphysics, at least when such neutrality can be achieved without too much cost.) What I take to be the most forceful argument against that possibility is the following:

- (1) Necessarily, if a thing dies at a time t , then the thing ceases⁹ to be present at t . (Intuitively, to say that a thing is *present* at a time t is to say that a part of the thing’s career occurs at t ; I mean by ‘ x is present at t ’ what many others apparently mean by ‘ x exists at t ’.¹⁰)
- (2) Necessarily, if a thing is alive at a time t , then the thing is present at t .
- (3) Necessarily, if a thing ceases to be present at a time t , then it is not present at any later time t^* .

⁸It seems to me that Feldman’s definition can be formulated somewhat more explicitly (though less elegantly) as follows: x is dead at t = df. there is some time t^* such that (1) t^* is earlier than t , (2) x dies at t^* , (3) x is not alive at t or at any time between t^* and t . (Instant t_2 is *between* instants t_1 and t_3 iff t_1 is earlier than t_2 and t_2 is earlier than t_3 .)

⁹To say that a thing x ceases to be present at t is to say that there is some interval I_1 leading up to t and some interval I_2 beginning at t such that x is present at each instant in I_1 and x is not present at any instant in I_2 .

¹⁰One often finds philosophers who endorse eternalism (roughly, the view that the past, present, and future entities are all equally real, all equally in existence) saying things like, “Although dinosaurs *exist* in that there *are* such things (they are real), they are entirely confined to the past, and so no dinosaur *exists at* any time in the year 2007.” See, e.g., Sider (2001: 55). Here, the phrase ‘exists at’ expresses a locational relation that (existing) entities can bear to some times and fail to bear to others. To avoid confusion, I prefer to use the phrase ‘is present at’ to express this relation.

- (4) Therefore, necessarily, if a thing dies at a time t , then the thing is not alive at any later time t^* .

The argument is valid, and (2) is hard to deny, but (1) and (3) are both highly contentious. (1) will be rejected by anyone who thinks that, say, human bodies, amoebas, or trees often continue to be present for a while after they die.¹¹ (3) will be rejected by anyone who believes in the possibility of ‘intermittent existence’ – roughly, the possibility of things with temporally gappy careers.¹² It is far from clear, then, that there are no metaphysically possible counterexamples to D1.

Against Feldman’s Definition

Feldman holds, correctly in my view, that a definition of ‘dead’ should leave open both (1) the possibility of things that go directly from being dead to being *alive*, and (2) the possibility of things that go directly from being alive to being in suspended animation and neither alive nor dead. But if this is right, then surely such a definition should also leave open the possibility of things that go directly from being dead to being in suspended animation and neither alive nor dead. I have in mind the following type of situation.

Suppose that *Beta* is a bacterium that lives an ordinary life, dies, and begins to decompose very slightly. At this point a team of advanced biological engineers freeze it and thereby halt its decomposition. While keeping it frozen at a very low temperature, the engineers begin the delicate process of repairing it. Without adding any new matter or removing any of the old, they alter *Beta*’s structure, molecule by molecule, until they have reversed the damage and decay that recently occurred. When their work is finished, *Beta* is again perfectly intact and undamaged, albeit still frozen. In particular, the engineers make *Beta* into an intrinsic, molecule-for-molecule duplicate of *Alpha*, a frozen bacterium that was put into suspended animation in the ordinary way. This, I think, makes it very plausible that *Beta* is also in suspended animation. Thus *Beta* dies, is dead for a period of time, then goes directly into suspended animation and (if the Wreen–Feldman view is correct) is neither alive nor dead while in that condition.

As before, my claim is not that ‘*Beta* is neither alive nor dead while in suspended animation’ is in fact the correct description of the above situation, much less that we should build this verdict into a definition of ‘dead.’ My claim is that a definition of ‘dead’ should not *rule out* that verdict: it should *leave open* the possibility of a situation in which a thing goes directly from being dead to being neither alive nor dead.

Unfortunately, D2 does not leave this open. To see this, suppose for *reductio* both that D2 is true and that

- (R) *Beta* is dead now, at instant t , and throughout some continuous interval, call it I , that includes t , but *Beta* will soon go directly from being dead to being neither alive nor dead, which status it will have throughout some continuous interval, call it I^* , that immediately follows interval I .

¹¹(1) is accepted by Yourgrau (1987, 2000), Hershenov (2005), and Olson (2004). It is rejected by Feldman (1992a,b, 2000), Carter (1999), Mackie (1999), Thomson (1997), and Baker (2000).

¹²(3) is accepted by, e.g., Wiggins (1980) and Lowe (1983). It is rejected by, e.g., Hershenov (2002), Hoffman and Rosenkrantz (1997: 159), and of course virtually all temporal parts theorists.

Roughly, D2 says that a thing is dead now just in case it died at an earlier time and has been non-living ever since that earlier time. So it tells us that if a thing is dead now, then that thing will *continue to be dead as long it remains non-living*. In particular, it entails that if Beta is dead throughout interval I, if interval I* immediately follows I, and if Beta is non-living throughout I*, then Beta will be dead throughout I* too. And this, of course, contradicts (R).

A New Definition of ‘Dead’

Let us say that a thing is in *stasis* just in case, intuitively, it is in a state of suspended animation that is incompatible both with being alive and with being dead. In order to leave open the possibility of things that cease to be dead by going into stasis (and hence without beginning to be alive), I suggest that we impose an additional requirement on the properties¹³ that an object must have at an instant if it is to count as being dead at that instant. Informally, the idea is something like this: in order to be *dead* (as opposed to merely being *non-living*) a thing must have a property that is ‘hostile to life’ – i.e., a property that guarantees not only that its instances are *non-living*, but also that they are *not in stasis*. I shall call such properties *toxic*.

Toxicity can, I think, be defined without the use of any distinctively biological primitives aside from ‘lives’ and ‘dies.’ Here is a first attempt:

- T1 F is toxic1 =df. F is a property, and necessarily, for any x and instant t, if x is alive at every instant in some interval that immediately precedes t, and x has F at t, then x dies at t.

There may be some properties whose acquisition by a living thing entails that the thing immediately *ceases to be alive* but whose acquisition does *not* entail that the thing immediately *dies*. *Being frozen* might be such a property. Other properties are more hostile to life: their acquisition by a living thing entails that it immediately *dies*. These properties are toxic1.

One problem with this definition is that it counts the property *having been non-living for the previous 3 months* as toxic1; after all, nothing can go directly from being alive to having been non-living for the previous three months, and *a fortiori* nothing can do this *without dying immediately*. But the property in question is not toxic in the relevant sense, since it can be possessed by things in stasis if any property can. (Anything that has been in stasis for the past 3 months has the given property at the present time.)

The appropriate remedy here is to add a clause to T1 requiring that the properties in question be intrinsic. As I mentioned earlier, if a property F is intrinsic, then whether or not a thing x has F at a time t is *independent* of both:

- (1) the relations that x bears to things outside itself, and
- (2) the condition of the world at times other than t.

Commonly suggested examples of intrinsic properties include shapes, rest masses, and temperatures. *Having been non-living for the previous 3 months* is clearly not intrinsic: whether or not a thing has that property at a time t is *not* purely a matter of what the thing is

¹³For simplicity I will assume that properties are abundant, and in particular that for any plurality of properties, there is a property that is their conjunction and that is intrinsic if they all are. I believe that my definitions could be re-stated so as to avoid relying on this assumption, though I will not attempt this here.

like at t ; it's also a matter of how the thing was throughout the months leading up to t . Adding the intrinsicity requirement yields:

- T2 F is toxic2=df. F is an intrinsic property, and necessarily, for any x and instant t , if x is alive at each instant in some interval that immediately precedes t and x has F at t , then x dies at t .^{14 15}

Now let me introduce a convenient abbreviation:

- A x is abiotic at t =df. either x has some toxic2 property at t or x is not present at t .

Some things may be abiotic now by having some toxic2 property now: perhaps this is the case for V. I. Lenin. Other things are abiotic now by failing to be present now: this seems to be Plato's situation. This abbreviation permits what I take to be an adequate definition of 'dead':

- D3 x is dead at t =df. (1) x is abiotic at t , and (2) x dies at t or at some earlier instant t^* such that x is abiotic at each instant between t^* and t .

Roughly put, D3 says that a thing's being dead now is a matter of its being abiotic now and its *having been* abiotic ever since some instant at which it died.¹⁶ We can stipulate that

¹⁴Some substance dualists may hold that we are immaterial souls, that we continue to be present after we die, and that a soul *dies* at a time t just in case it undergoes a certain *relational* change at t – namely, becoming disembodied. In that case, it is plausible that a soul can be dead at a time t even if it does not then have any intrinsic property whose acquisition by a living thing would entail that the thing immediately dies. Those who are moved by this worry can replace toxicity2 with toxicity2*: F is toxic2*=df. F is a *temporally local* property, and necessarily, for any x and time t , if x is alive at each instant in some interval that immediately precedes t and x has F at t , then x dies at t . Roughly, a property F is temporally local just in case whether or not a thing x has F at t depends only on the intrinsic properties of the world at t . Temporally local properties need not be intrinsic themselves; *being disembodied*, e.g., seems to be temporally local but not intrinsic.

¹⁵Consider some organism O in stasis whose temperature is just above absolute zero; let F_o be the conjunction of its intrinsic properties. Suppose you think that it is metaphysically impossible for a thing to go *directly* from being alive to having F_o . (Perhaps such a change would necessarily involve too great a discontinuity in a thing's intrinsic properties to be nomically or even metaphysically possible.) In that case F_o counts as toxic2, despite being compatible with being in stasis. Those who are moved by this worry can replace toxicity2 with toxicity3: F is toxic3=df. F is an intrinsic property, and necessarily, for any x and instants t_1 and t_2 , if x is alive at t_1 and has F at t_2 , then x dies at t_2 or some time between t_1 and t_2 . Roughly, a property is toxic3 iff it's impossible for a thing to go from being alive at one time to having that property at a later time without dying. Presumably it is possible for a thing to go from being alive to having F_o without dying, so that property is not toxic3. Consider, on the other hand, *Lenin-likeness*, the conjunction of the intrinsic properties that V. I. Lenin has now. It does seem impossible to go from being alive at one time to being Lenin-like at a later time without dying, so that property is apparently toxic3. Similarly for the overall intrinsic condition of any dead thing that is present now (if there are any).

¹⁶Suppose that I am alive at 11:00 AM, that I die at 11:30 AM, remain dead for 1 min, and am revitalized at 11:31 AM. I then die at 11:45 AM, remain dead for 30 s, and am revitalized at 11:45:30 AM. I then die at 11:52:30 AM, remain dead for 15 s, and am revitalized at 11:52:45 AM, and so on. Let us further stipulate that I have *Lenin-likeness* at noon and permanently thereafter. (*Lenin-likeness* is the conjunction of all of Lenin's current intrinsic properties.) Am I dead at 12:01 PM? Intuitively, yes. But it may seem that D3 tells us that I am not dead then, given that, for any instant prior to noon at which I die, there is a later instant prior to noon at which I am alive and hence non-abiotic. However, it remains open to us to hold that in addition to all of my deaths in the morning, I also die at 12:00 PM sharp. Since I am abiotic thereafter, D3 would in that case tell us that I am dead at 12:01 PM. (This does, however, force us to reject the initially appealing principle that, necessarily, if a thing x dies at t , then there is some interval I leading up to t such for each instant t^* in I , x is either alive or in stasis at t^* .) Thanks to Ted Sider for prompting me to think about some related cases.

a thing is in *stasis* at *t* just in case (1) it is not alive at *t* and (2) it is non-abiotic (i.e., it is present and free from toxic2 properties) at *t*. There are five features of D3 that deserve comment.

First, D3 makes conceptual space for a distinction between (a) genuinely dead things and, if such are possible, (b) ‘undead’ things, i.e., things that have died and then either come back to life or gone into stasis. D3 tells us that the difference between these groups of things is that the dead are all abiotic (non-present or in possession of a toxic2 property), whereas the undead things are not.

Second, in case this is not already obvious, D3 makes conceptual space for the possibility of things that die and then go directly from being dead to being neither alive nor dead. Suppose that Beta died, was frozen while dead, was repaired, was put into suspended animation, and was present but non-living throughout. Moreover, suppose that during the process of repair, Beta went from having to lacking toxic2 properties. In that case, D3 tells us that during the process of repair, Beta went directly from being dead to being in stasis and hence being neither alive nor dead.

Third, it is important to note that D3 also leaves open both of the following possibilities: (1) that typical examples of frozen-but-revivable organisms are *dead*, and (2) that these organisms are *alive*. If one thinks that such an organism is dead, then presumably one will think that at some point prior to or during the process of being frozen, the organism died and either ceased to be present or acquired a toxic2 property, an intrinsic property that no living thing can acquire without dying immediately. And in that case, one will take D3 to yield the correct verdict – that the organism is dead. (For all I have said here, it may be a metaphysically necessary truth that living things either cease to be present or acquire toxic2 properties when they freeze: D3 leaves the matter open.) And if, on the other hand, one thinks that a typical frozen-but-revivable organism is *still alive*, then one will grant that throughout the process of freezing, the organism remained present and never acquired a toxic2 property. In that case, one will regard D3 as yielding the verdict that the given organism is not dead, which one will take to be correct. So, regardless of whether one takes these organisms to be alive, dead, or neither, one will see D3 as giving the right results.

Fourth, D3 leaves open the possibility of a thing’s being dead at a time *at which it dies*. Suppose that John dies at noon. Is he dead at that instant? According to D3, it depends upon John’s condition at noon. Perhaps John is still the picture of good health at noon but will possess a toxic2 property, or be non-present, at each instant thereafter. In that case, D3 tells us that John is *not* dead at noon (but is dead thereafter), which seems correct. On the other hand, perhaps John is alive throughout some interval leading up to noon but has a toxic2 property, or is non-present, *at* noon. In that case D3 tells us that John *is* dead at noon, which again seems right.

Fifth, it is worthwhile to point out that D3 meshes well with a claim that Rosenberg, Feldman, and Wilson have made about certain cases of biological fission. They hold that when an amoeba divides, its career ends, it ceases to be present, and (*a fortiori*) it ceases to be alive, but it does not then *die*; rather, it ceases to be alive and ceases to be present *deathlessly*.¹⁷ Consider an amoeba, Gamma, that lives, dies (at time *t*₁), and is revitalized at a later time, *t*₂. Gamma remains alive from *t*₂ to *t*₃, at which time it undergoes fission and ceases to be present permanently.

¹⁷Rosenberg (1983: 22), Feldman (1992a: 66, 1992b: 173), Wilson (1999: 101).

| t1 | t2 | | t3 | t4 |
|------------|----------------------|----------------|--|----------------|
| Gamma dies | Gamma is revitalized | Gamma is alive | Gamma divides, permanently ceasing to be present and ceasing to be alive | Is Gamma dead? |

Gamma is non-present and hence abiotic now, at time t4. But is Gamma now *dead*? Intuitively, this would seem to depend upon whether Gamma died at t3, when it divided.

If Rosenberg and his allies are right, and Gamma did not die at t3, then presumably we should count Gamma as being neither alive nor dead now – but instead as merely being ‘gone.’ And of course this is exactly the result that D3 delivers: it tells us that in order for Gamma to be dead now, it must be abiotic now (which it is) and must *have been* abiotic ever since some instant at which it died. On our current assumption that Gamma didn’t die at t3, t1 qualifies as the *only* instant at which Gamma died. But it’s *not* the case that Gamma has been abiotic ever since t1. (It was alive from t2 to t3.).¹⁸

On the other hand, if Rosenberg and his allies are wrong, and Gamma *did* die at t3, then it seems intuitively correct to say that Gamma *is* dead now. Here again D3 yields the right conclusion: for in this case the most recent instant at which Gamma died was t3, and Gamma *has* been abiotic ever since *that* time. So, *regardless* of whether amoebas die when they divide, D3 delivers the intuitively correct verdicts as applied to the relevant cases.

Conclusion

I have defined ‘dead’ in terms of ‘lives’ and ‘dies,’ together with various logical, temporal, and general-purpose metaphysical concepts that I take to be tolerably clear.¹⁹ I have drawn the distinction between being dead and being in stasis in terms of the concept of a toxic2 property. Dead things, I have claimed, are either non-present or have a toxic2 property; whereas things in stasis (if such a condition is possible) are present and have no toxic2 properties. I have defined a toxic2 property as an intrinsic property that cannot be acquired by a living thing unless the thing *dies* (as opposed to merely *ceasing to be alive*) at the moment of acquisition.

But under what conditions, one might wonder, is it correct to say that a living thing *dies*, as opposed to merely *ceasing to be alive*? This is an important question, and it is one that we need to be able to answer if we are to give a maximally informative analysis of ‘dies.’

¹⁸Suppose that we had defined ‘dead’ as follows: (D3*) x is dead at t=df. (1) x dies at some time earlier than t, and (2) x is abiotic at t. D3* yields the result that Gamma is dead at t4, and it does so even if Rosenberg and Feldman are right that Gamma doesn’t die at t3. For this reason I prefer D3 to D3*.

¹⁹The temporal concepts I have invoked are those expressed by: ‘earlier than’, ‘is an instant’, ‘is an interval’ and ‘interval I immediately precedes [or follows] instant t.’ The general-purpose metaphysical concepts I’ve invoked are those expressed by: ‘x is *present* at t’, ‘x₁ ... x_n are *necessarily* such that’, ‘F is an *intrinsic* property’, and ‘x *instantiates* [has] F at t’.

As I suggested earlier, it seems plausible that the difference between dying and going into stasis is that when a thing goes into stasis, it retains²⁰ a ‘sufficiently robust, internally-grounded capacity to be alive’; but when it *dies*, it ceases to possess such a capacity. Of course, this raises difficult questions about (1) what it is to have an internally-grounded capacity to be alive, and (2) what it is for such a capacity to be ‘sufficiently robust.’ But these are questions confronting those who would attempt to define ‘dies’ in terms of ‘lives,’ and I have made no such attempt.

My project has been to *use* ‘dies,’ together with ‘lives,’ to define ‘dead.’ Although this allowed me to skirt certain puzzles that confront the definer of ‘dies,’ the project gives rise to new puzzles of its own. (Witness Rosenberg’s and Feldman’s failed proposals.) It is only these latter puzzles that I have tried to solve.^{21 22}

References

- Baker, L. R. (2000). *Persons and bodies: A constitution view*. Cambridge: Cambridge University Press.
- Carter, W. R. (1999). Will I be a dead person? *Philosophy and Phenomenological Research*, 59, 167–72.
- Feldman, F. (1989). On dying as a process. *Philosophy and Phenomenological Research* L, 2, 375–390.
- Feldman, F. (1992a). *Confrontations with the reaper: A philosophical study of the nature and value of death*. Oxford: Oxford University Press.
- Feldman, F. (1992b). The enigma of death. *Philosophia*, 21, 163–181.
- Feldman, F. (1998). Death. In E. Craig (Ed.), *Routledge encyclopedia of philosophy* (pp. 817–823). London: Routledge.
- Feldman, F. (2000). The termination thesis. *Midwest Studies in Philosophy*, 24, 98–115.
- Hershenov, D. (2002). Van Inwagen, Zimmerman and the materialist conception of resurrection. *Religious Studies: An International Journal for the Philosophy of Religion*, 38(1), 1–19.
- Hershenov, D. (2005). Do dead bodies pose a problem for biological approaches to personal identity? *Mind*, 114, 31–59.
- Hoffman, J., & Rosenkrantz, G. (1997). *Substance: Its nature and existence*. London: Routledge.
- Lowe, E. J. (1983). On the identity of artifacts. *Journal of Philosophy*, 80, 220–232.
- Mackie, D. (1999). Personal identity and dead people. *Philosophical Studies*, 95, 219–242.
- Olson, E. (2004). Animalism and the corpse problem. *Australasian Journal of Philosophy*, 82, 265–274.
- Rosenberg, J. F. (1983). *Thinking clearly about death*. Englewood Cliffs: Prentice-Hall.
- Rosenberg, J. F. (1998). *Thinking clearly about death*, (2nd ed.) Indianapolis: Hackett.
- Sider, T. (2001). *Four dimensionalism: An ontology of persistence and time*. Oxford: Oxford University Press.
- Smith, J. M. (1986). *The problems of biology*. Oxford: Oxford University Press.
- Thomson, J. J. (1997). People and their bodies. In J. Dancy (Ed.), *Reading parfit*. Blackwell.

²⁰Or ‘acquires’ if, as in my case, the thing was dead just prior to having the capacity.

²¹Throughout this paper I have ignored the possibility of worlds in which things travel backward in time. (See Sider 2001: 101–109 and references therein.) If there are any such worlds, I suspect that they would supply counterexamples to D3. Suppose, e.g., that Lenin’s corpse = Lenin, and that the corpse is transported to the year 1776. Then it may seem correct to say that Lenin is dead at some time *t* in 1776, even though there is no *earlier* time at which Lenin died. However, I also suspect that D4 could be modified in a way that salvages much of its structure and basic insights. Perhaps this could be done by judiciously replacing (1) talk of *instants and intervals of time* in parts of D3 and T2 with talk of *instants and intervals of proper (or ‘personal’) time* and (2) talk of the *earlier than* relation in parts of D3 and T2 with talk of the *earlier than with respect to proper time* relation. I will not offer any specific proposal as to how this should be done.

²²For helpful comments and suggestions, I am grateful to Yuri Balashav, Morwenna Borden, Jerry Cederblom, Andrew Cortens, Fred Feldman, Laura Grams, Brian Kierland, Halla Kim, Noah Lemos, Andrew Newman, Tony Roark, Adam Sennet, Ted Sider, two referees for this journal, and audiences at Boise State University, the College of William and Mary, and the University of Georgia.

- Weatherston, B. (2004). Intrinsic vs. extrinsic properties. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy*, Fall 2004 Edition. <<http://www.plato.stanford.edu/archives/fall2004/entries/intrinsic-extrinsic/>>
- Wiggins, D. (1980). *Sameness and substance*. Cambridge, MA: Harvard University Press.
- Wilson, J. (1999). *Biological individuality*. Cambridge: Cambridge University Press.
- Wreen, M. J. (1987). The definition of death. *Public Affairs Quarterly*, 1(4), 87–99.
- Yourgrau, P. (1987). The dead. *Journal of Philosophy*, 84, 84–101.
- Yourgrau, P. (2000). Can the dead really be buried? *Midwest Studies in Philosophy*, 24, 46–68.