

SURVIVAL AND IDENTITY

DAVID LEWIS

What is it that matters in survival? Suppose I wonder whether I will survive the coming battle, brainwashing, brain transplant, journey by matter-transmitter, purported reincarnation or resurrection, fission into twins, fusion with someone else, or what not. What do I really care about? If it can happen that some features of ordinary, everyday survival are present but others are missing, then what would it take to make the difference between something practically as good as commonplace survival and something practically as bad as commonplace death?

I answer, along with many others: *what matters in survival is mental continuity and connectedness*. When I consider various cases in between commonplace survival and commonplace death, I find that what I mostly want in wanting survival is that my mental life should flow on. My present experiences, thoughts, beliefs, desires, and traits of character should have appropriate future successors. My total present mental state should be but one momentary stage in a continuing succession of mental states. These successive states should be interconnected in two ways. First, by bonds of similarity. Change should be gradual rather than sudden, and (at least in some respects) there should not be too much change overall. Second, by bonds of lawful causal dependence. Such change as there is should conform, for the most part, to lawful regularities concerning the succession of mental states—regularities, moreover, that are exemplified in everyday cases of survival. And this should be so not by accident (and also not, for instance, because some demon has set out to create a succession of mental states patterned to counterfeit our ordinary mental life) but rather because each succeeding mental state causally depends for its character on the states immediately before it.

I refrain from settling certain questions of detail. Perhaps my emphasis should be on *connectedness*: direct relations of similarity and causal dependence between my present mental state and each of its successors; or perhaps I should rather emphasize *continuity*: the existence of step-by-step paths from here to there, with extremely strong local connectedness from each step to the next. Perhaps a special place should be given to the special kind of continuity and connectedness that constitute memory;¹ or perhaps not. Perhaps the "mental" should be construed narrowly, perhaps broadly. Perhaps nonmental continuity and connectedness—in my appearance and voice, for instance—also should have at least some weight. It does not matter, for the present, just which version I would prefer of the thesis that what matters is mental continuity and connectedness. I am sure that I would endorse some version, and in this paper I want to deal with a seeming problem for any version.

The problem begins with a well-deserved complaint that all this about mental connectedness and continuity is too clever by half. I have forgotten to say what should have been said first of all. What matters in survival is survival. If I wonder whether I will survive, what I mostly care about is quite simple. When it's all over, will I myself—the very same person now thinking these thoughts and writing these words—still exist? Will any one of those who do exist afterward be me? In other words, *what matters in survival is identity*—identity between the I who exists now and the surviving I who will, I hope, still exist then.

One question, two answers! An interesting answer, plausible to me on reflection but far from obvious: that what matters is mental connectedness and continuity between my present mental state and other mental states that will succeed it in the future. And a compelling commonsense answer, an unhelpful platitude that cannot credibly be denied: what matters is identity between myself, existing now, and myself, still existing in the future.

If the two answers disagreed and we had to choose one, I suppose we would have to prefer the platitude of common sense to the interesting philosophical thesis. Else it would be difficult to believe one's own philosophy! The only hope for the first answer, then, is to show that we need not choose: the answers are compatible, and both are right. That is the claim I wish to defend. I say that it cannot happen that what matters in survival according to one

answer is present while what matters in survival according to the other answer is lacking.

PARFIT'S ARGUMENT

Derek Parfit has argued that the two answers cannot both be right, and we must therefore choose.² (He chooses the first.) His argument is as follows:

(a) Identity is a relation with a certain formal character. It is one-one and it does not admit of degree.

(b) A relation of mental continuity and connectedness need not have that formal character. We can imagine problem cases in which any such relation is one-many or many-one, or in which it is present to a degree so slight that survival is questionable.

Therefore, since Parfit believes as I do that what matters in survival is some sort of mental continuity or connectedness,

(c) What matters in survival is not identity. At most, what matters is a relation that coincides with identity to the extent that the problem cases do not actually arise.

Parfit thinks that if the problem cases did arise, or if we wished to solve them hypothetically, questions of personal identity would have no compelling answers. They would have to be answered arbitrarily, and in view of the discrepancy stated in (a) and (b), there is no answer that could make personal identity coincide perfectly with the relation of mental continuity and connectedness that matters in survival.

Someone else could just as well run the argument in reverse. Of course what matters in survival is personal identity. Therefore what matters cannot be mental continuity or connectedness, in view of the discrepancy stated in premises (a) and (b). It must be some better-behaved relation.

My task is to disarm both directions of the argument and show that the opposition between what matters and identity is false. We can agree with Parfit (and I think we should) that what matters in questions of personal identity is mental continuity or connectedness, and that this might be one-many or many-one, and admits of degree. At the same time we can consistently agree with common sense (and I think we should) that what matters in questions of personal identity—even in the problem cases—is identity.

I do not attack premises (a) and (b). We could, of course, say

"identity" and just mean mental continuity and connectedness. Then we would deny that "identity" must have the formal character stated in (a). But this verbal maneuver would not meet the needs of those who think, as I do, that what matters in survival is literally *identity*: that relation that everything bears to itself and to no other thing. As for (b), the problem cases clearly are possible under Parfit's conception of the sort of mental continuity or connectedness that matters in survival; or under any conception I might wish to adopt. The questions about continuity and connectedness which I left open are not relevant, since no way of settling them will produce a relation with the formal character of identity. So we do indeed have a discrepancy of formal character between identity and any suitable relation of mental continuity and connectedness.

But what does that show? Only that the two relations are different. And we should have known that from the start, since they have different *relata*. He who says that what matters in survival is a relation of mental continuity and connectedness is speaking of a relation among more or less momentary person-stages, or time-slices of continuant persons, or persons-at-times. He who says that what matters in survival is identity, on the other hand, must be speaking of identity among temporally extended continuant persons with stages at various times. What matters is that one and the same continuant person should have stages both now and later. Identity among stages has nothing to do with it, since stages are momentary. Even if you survive, your present stage is not identical to any future stage.³ You know that your present stage will not survive the battle—that is not disconcerting—but will *you* survive?

THE R-RELATION AND THE I-RELATION

Pretend that the open questions have been settled, so that we have some definite relation of mental continuity and connectedness among person-stages in mind as the relation that matters in survival. Call it the *R-relation*, for short. If you wonder whether you will survive the coming battle or what-not, you are wondering whether any of the stages that will exist afterward is R-related to you-now, the stage that is doing the wondering. Similarly for other

"questions of personal identity." If you wonder whether this is your long-lost son, you mostly wonder whether the stage before you now is R-related to certain past stages. If you also wonder whether he is a reincarnation of Nero, you wonder whether this stage is R-related to other stages farther in the past. If you wonder whether it is in your self-interest to save for your old age, you wonder whether the stages of that tiresome old gaffer you will become are R-related to you-now to a significantly greater degree than are all the other person-stages at this time or other times. If you wonder as you step into the duplicator whether you will leave by the left door, the right door, both, or neither, you are again wondering which future stages, if any, are R-related to you-now.

Or so say I. Common sense says something that sounds different: in wondering whether you will survive the battle, you wonder whether you—a continuant person consisting of your present stage along with many other stages—will continue beyond the battle. Will you be identical with anyone alive then? Likewise for other questions of personal identity.

Put this way, the two answers seem incomparable. It is pointless to compare the formal character of identity itself with the formal character of the relation R that matters in survival. Of course the R-relation among stages is not the same as identity either among stages or among continuants. But identity among continuant persons induces a relation among stages: the relation that holds between the several stages of a single continuant person. Call this the *I-relation*. It is the I-relation, not identity itself, that we must compare with the R-relation. In wondering whether you will survive the battle, we said, you wonder whether the continuant person that includes your present stage is identical with any of the continuant persons that continue beyond the battle. In other words: whether it is identical with any of the continuant persons that include stages after the battle. In other words: you wonder whether any of the stages that will exist afterward is I-related to—belongs to the same person as—your present stage. If questions of survival, or personal identity generally, are questions of identity among continuant persons, then they are also questions of I-relatedness among person-stages; and conversely. More precisely: *if common sense is right that what matters in survival is identity*

among continuant persons, then you have what matters in survival if and only if your present stage is I-related to future stages. I shall not distinguish henceforth between the thesis that what matters in survival is identity and the thesis that what matters in survival is the I-relation. Either way, it is a compelling platitude of common sense.

If ever a stage is R-related to some future stage but I-related to none, or if ever a stage is I-related to some future stage but R-related to none, then the platitude that what matters is the I-relation will disagree with the interesting thesis that what matters is the R-relation. But no such thing can happen, I claim; so there can be no such disagreement. In fact, I claim that *any stage is I-related and R-related to exactly the same stages*. And I claim this not only for the cases that arise in real life, but for all possible problem cases as well. Let us individuate relations, as is usual, by necessary coextensiveness. Then I claim that *the I-relation is the R-relation*.

A continuant person is an aggregate⁴ of person-stages, each one I-related to all the rest (and to itself). For short: a person is an I-interrelated aggregate. Moreover, a person is not part of any larger I-interrelated aggregate; for if we left out any stages that were I-related to one another and to all the stages we included, then what we would have would not be a whole continuant person but only part of one. For short: a person is a maximal I-interrelated aggregate. And conversely, any maximal I-interrelated aggregate of person-stages is a continuant person. At least, I cannot think of any that clearly is not.⁵ So far we have only a small circle, from personhood to I-interrelatedness and back again. That is unhelpful; but if the I-relation is the R-relation, we have something more interesting: a noncircular definition of personhood. I claim that *something is a continuant person if and only if it is a maximal R-interrelated aggregate of person-stages*. That is: if and only if it is an aggregate of person-stages, each of which is R-related to all the rest (and to itself), and it is a proper part of no other such aggregate.

I cannot tolerate any discrepancy in formal character between the I-relation and the R-relation, for I have claimed that these relations are one and the same. Now although the admitted discrepancy between identity and the R-relation is harmless in itself, and although the I-relation is not identity, still it may seem that the I-

relation inherits enough of the formal character of identity to lead to trouble. For suppose that S_1, S_2, \dots are person-stages; and suppose that C_1 is the continuant person of whom S_1 is a stage, C_2 is the continuant person of whom S_2 is a stage, and so on. Then any two of these stages S_i and S_j are I-related if and only if the corresponding continuant persons C_i and C_j are identical. The I-relations among the stages mirror the structure of the identity relations among the continuants.

I reply that the foregoing argument wrongly takes it for granted that every person-stage is a stage of one and only one continuant person. That is so ordinarily; and when that is so, the I-relation does inherit much of the formal character of identity. But ordinarily the R-relation also is well behaved. In the problem cases, however, it may happen that a single stage S is a stage of two or more different continuant persons. Worse, some or all of these may be persons to a diminished degree, so that it is questionable which of them should count as persons at all. If so, there would not be any such thing (in any straightforward way) as *the* person of whom S is a stage. So the supposition of the argument would not apply. It has not been shown that the I-relation inherits the formal character of identity in the problem cases. Rather it might be just as ill behaved as the R-relation. We shall examine the problem cases and see how that can happen.⁶

It would be wrong to read my definition of the I-relation as saying that person-stages S_1 and S_2 are I-related if and only if the continuant person of whom S_1 is a stage and the continuant person of whom S_2 is a stage are identical. The definite articles require the presupposition that I have just questioned. We should substitute the indefinite article: S_1 and S_2 are I-related if and only if a continuant person of whom S_1 is a stage and a continuant person of whom S_2 is a stage are identical. More simply: if and only if there is some one continuant person of whom both S_1 and S_2 are stages.

One seeming discrepancy between the I-relation and the R-relation need not disturb us. The I-relation must be symmetrical, whereas the R-relation has a direction. If a stage S_2 is mentally connected to a previous stage S_1 , S_1 is available in memory to S_2 and S_2 is under the intentional control of S_1 to some extent—not the other way around.⁷ We can say that S_1 is R-related *forward* to S_2 , whereas S_2 is R-related *backward* to S_1 . The forward and back-

ward R-relations are converses of one another. Both are (normally) antisymmetrical. But although we can distinguish the forward and backward R-relations, we can also merge them into a symmetrical relation. That is the R-relation I have in mind: S_1 and S_2 are R-related *simpliciter* if and only if S_1 is R-related either forward or backward to S_2 .

While we are at it, let us also stipulate that every stage is R-related—forward, backward, and *simpliciter*—to itself. The R-relation, like the I-relation, is reflexive.

Parfit mentions two ways for a discrepancy to arise in the problem cases. First, the R-relation might be one-many or many-one. Second, the R-relation admits in principle of degree, and might be present to a degree that is markedly subnormal and yet not negligible. Both possibilities arise in connection with fission and fusion of continuant persons, and also in connection with immortality or longevity.

FISSION AND FUSION

Identity is one-one, in the sense that nothing is ever identical to two different things. Obviously neither the I-relation nor the R-relation is one-one in that sense. You-now are a stage of the same continuant as many other stages, and are R-related to them all. Many other stages are stages of the same continuant as you-now, and are R-related to you-now. But when Parfit says that the R-relation might be one-many or many-one, he does not just mean that. Rather, he means that one stage might be R-related to many stages that are not R-related to one another, and that many stages that are not R-related to one another might all be R-related to one single stage. (These possibilities do not differ once we specify that the R-relation is to be taken as symmetrical.) In short, the R-relation might fail to be transitive.

In a case of fission, for instance, we have a prefission stage that is R-related forward to two different, simultaneous postfission stages that are not R-related either forward or backward to each other. The forward R-relation is one-many, the backward R-relation is many-one, and the R-relation *simpliciter* is intransitive.

In a case of fusion we have two prefusion stages, not R-related either forward or backward to each other, that are R-related for-

ward to a single postfusion stage. The forward R-relation is many-one, the backward R-relation is one-many, and the R-relation *simpliciter* is again intransitive.

Identity must be transitive, but the I-relation is not identity. The I-relation will fail to be transitive if and only if there is partial overlap among continuant persons. More precisely: if and only if two continuant persons C_1 and C_2 have at least one common stage, but each one also has stages that are not included in the other. If S is a stage of both, S_1 is a stage of C_1 but not C_2 , and S_2 is a stage of C_2 but not C_1 , then transitivity of the I-relation fails. Although S_1 is I-related to S , which in turn is I-related to S_2 , yet S_1 is not I-related to S_2 . In order to argue that the I-relation, unlike the R-relation, must be transitive, it is not enough to appeal to the uncontroversial transitivity of identity. The further premise is needed that partial overlap of continuant persons is impossible.

Figure 1.1 shows how to represent fission and fusion as cases of partial overlap. The continuant persons involved, C_1 and C_2 , are the two maximal R-interrelated aggregates of stages marked by the two sorts of cross-hatching. In the case of fission, the prefission stages are shared by both continuants. In the case of fusion, the postfusion stages are likewise shared. In each case, we have a shared stage S that is I-related to two stages S_1 and S_2 that are not I-related to each other. Also S is R-related to S_1 and S_2 (forward in the case of fission, backward in the case of fusion) but S_1 and S_2 are not R-related to each other. More generally, the I-relation and the R-relation coincide for all stages involved in the affair.

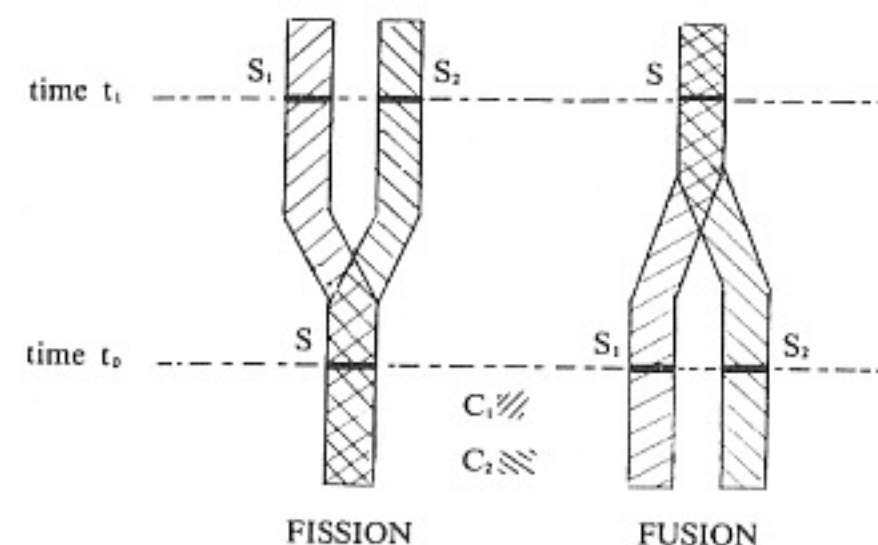


Figure 1

There is, however, a strong reason for denying that continuant persons can overlap in this way. From this denial it would indeed follow (as it does not follow from the transitivity of identity alone) that the I-relation cannot share the possible intransitivities of the R-relation.

The trouble with overlap is that it leads to overpopulation. To count the population at a given time, we can count the continuant persons who have stages at that time; or we can count the stages. If there is overlap, there will be more continuants than stages. (I disregard the possibility that one of the continuants is a time traveler with distinct simultaneous stages.) The count of stages is the count we accept; yet we think we are counting persons, and we think of persons as continuants rather than stages. How, then, can we tolerate overlap?

For instance, we say that in a case of fission *one* person becomes *two*. By describing fission as initial stage-sharing we provide for the two, but not for the one. There are two all along. It is all very well to say from an eternal or postfission standpoint that two persons (with a common initial segment) are involved, but we also demand to say that on the day before the fission only *one* person entered the duplication center; that his mother did not bear twins; that until he fissions he should only have one vote; and so on. Counting at a time, we insist on counting a person who will fission as one. We insist on a method of counting persons that agrees with the result of counting stages, though we do not think that counting persons just *is* counting (simultaneous) stages.

It is not so clear that we insist on counting a product of fusion as one (or a time traveler meeting himself as two). We are not sure what to say. But suppose we were fully devoted to the doctrine that the number of different persons in existence at a time is the number of different person-stages at that time. Even so, we would not be forced to deny that continuant persons could overlap. We would therefore not be driven to conclude that the I-relation cannot share the possible intransitivities of the R-relation.

The way out is to deny that we must invariably count two non-identical continuants as two. We might count not by identity but by a weaker relation. Let us say that continuants C_1 and C_2 are *identical-at-time- t* if and only if they both exist at t and their stages at t are identical. (More precisely: C_1 and C_2 both have stages at t ,

and all and only stages of C_1 at t are stages of C_2 at t .) I shall speak of such relations of identity-at-a-time as relations of *tensed identity*. Tensed identity is not a kind of identity. It is not identity among stages, but rather a derivative relation among continuants which is induced by identity among stages. It is not identity among continuants, but rather a relation that is weaker than identity whenever different continuants have stages in common. If we count continuants by tensed identity rather than by identity, we will get the right answer—the answer that agrees with the answer we get by counting stages—even if there is overlap. How many persons entered the duplication center yesterday? We may reply: C_1 entered and C_2 entered, and no one else; although C_1 and C_2 are not identical today, and are not identical simpliciter, they were identical yesterday. So counting by identity-yesterday, there was only one. Counting by identity-today, there were two; but it is inappropriate to count by identity-today when we are talking solely about the events of yesterday. Counting by identity simpliciter there were two; but in talking about the events of yesterday it is as unnatural to count by identity as it is to count by identity-today. There is a way of counting on which there are two all along; but there is another way on which there are first one and then two. The latter has obvious practical advantages. It should be no surprise if it is the way we prefer.

It may seem far-fetched to claim that we ever count persons otherwise than by identity simpliciter. But we sometimes *do* count otherwise. If an infirm man wishes to know how many roads he must cross to reach his destination, I will count by identity-along-his-path rather than by identity. By crossing the Chester A. Arthur Parkway and Route 137 at the brief stretch where they have merged, he can cross both by crossing only one road. Yet these two roads are certainly not identical.

You may feel certain that you count persons by identity, not by tensed identity. But how can you be sure? Normal cases provide no evidence. When no stages are shared, both ways of counting agree. They differ only in the problem cases: fission, fusion, and another that we shall soon consider. The problem cases provide no very solid evidence either. They are problem cases just because we cannot consistently say quite all the things we feel inclined to. We must strike the best compromise among our conflicting initial

opinions. Something must give way; and why not the opinion that of course we count by identity, if that is what can be sacrificed with least total damage?

A relation to count by does not have to be identity, as the example of the roads shows. But perhaps it should share the key properties of identity. It should at least be an *equivalence* relation: reflexive, symmetrical, and transitive. Relations of tensed identity are equivalence relations. Further, it should be an *indiscernibility* relation; not for all properties whatever, as identity is, but at least for some significant class of properties. That is, it ought to be that two related things have exactly the same properties in that class. Identity-at-time-*t* is an indiscernibility relation for a significant class of properties of continuant persons: those properties of a person which are logically determined by the properties of his stage at *t*. The class includes the properties of walking, being tall, being in a certain room, being thirsty, and believing in God at time *t*; but not the properties of being forty-three years old, gaining weight, being an ex-Communist, or remembering one's childhood at *t*. The class is sizable enough, at any rate, to make clear that a relation of tensed identity is more of an indiscernibility relation than is identity-along-a-path among roads.

If we are prepared to count a product of fusion as two, while still demanding to count a person who will fission as one, we can count at *t* by the relation of identity-at-all-times-up-to-*t*. This is the relation that holds between continuants *C*₁ and *C*₂ if and only if (1) they both exist at some time no later than *t*, (2) at any time no later than *t*, either both exist or neither does, and (3) at any time no later than *t* when both exist, they have exactly the same stages. Again, this is a relation among continuants that is weaker than identity to the extent that continuants share stages. Although derived from identity (among stages) it is of course not itself identity. It is even more of an indiscernibility relation than identity-at-*t*, since it confers indiscernibility with respect to such properties as being forty-three years old, gaining weight (in one sense), being an ex-Communist, and remembering one's childhood at *t*; though still not with respect to such properties as being, at *t*, the next winner of the State Lottery.

It may be disconcerting that we can have a single name for one person (counting by tensed identity) who is really two nonidentical

persons because he will later fission. Isn't the name ambiguous? Yes; but so long as its two bearers are indiscernible in the respects we want to talk about, the ambiguity is harmless. If *C*₁ and *C*₂ are identical-at-all-times-up-to-now and share the name "Ned" it is idle to disambiguate such remarks as "Ned is tall," "Ned is waiting to be duplicated," "Ned is frightened," "Ned only decided yesterday to do it," and the like. These will be true on both disambiguations of "Ned," or false on both. Before the fission, only predictions need disambiguating. After the fission, on the other hand, the ambiguity of "Ned" will be much more bother. It can be expected that the ambiguous name "Ned" will then fall into disuse, except when we wish to speak of the shared life of *C*₁ and *C*₂ before the fission.

But what if we don't know whether Ned will fission? In that case, we don't know whether the one person Ned (counting by identity-now) is one person, or two, or many (counting by identity). Then we don't know whether "Ned" is ambiguous or not. But if the ambiguity is not a practical nuisance, we don't need to know. We can wait and see whether or not we have been living with a harmless ambiguity.

This completes my discussion of fission and fusion. To summarize: if the R-relation is the I-relation, and in particular if continuant persons are maximal R-interrelated aggregates of person-stages, then cases of fission and fusion must be treated as cases of stage-sharing between different, partially overlapping continuant persons. If so, the R-relation and the I-relation are alike intransitive, so there is no discrepancy on that score. If it is granted that we may count continuant persons by tensed identity, then this treatment does not conflict with our opinion that in fission one person becomes two; nor with our opinion (if it really is our opinion) that in fusion two persons become one.

LONGEVITY

I turn now to a different problem case. Parfit has noted that mental connectedness will fade away eventually. If the R-relation is a matter of direct connectedness as well as continuity, then intransitivities of the R-relation will appear in the case of a person (if it is a person!) who lives too long.

Consider Methuselah. At the age of 100 he still remembers his childhood. But new memories crowd out the old. At the age of 150 he has hardly any memories that go back before his twentieth year. At the age of 200 he has hardly any memories that go back before his seventieth year; and so on. When he dies at the age of 969, he has hardly any memories that go beyond his 839th year. As he grows older he grows wiser; his callow opinions and character at age 90 have vanished almost without a trace by age 220, but his opinions and character at age 220 also have vanished almost without a trace by age 350. He soon learns that it is futile to set goals for himself too far ahead. At age 120, he is still somewhat interested in fulfilling the ambitions he held at age 40; but at age 170 he cares nothing for those ambitions, and it is beginning to take an effort of will to summon up an interest in fulfilling his aspirations at age 80. And so it goes.

We sometimes say: in later life I will be a different person. For us short-lived creatures, such remarks are an extravagance. A philosophical study of personal identity can ignore them. For Methuselah, however, the fading-out of personal identity looms large as a fact of life. It is incumbent on us to make it literally true that he will be a different person after one and one-half centuries or so.

I should imagine that this is so just in virtue of normal aging over 969 years. If you disagree, imagine that Methuselah lives much longer than a bare millennium (Parfit imagines the case of immortals who change mentally at the same rate as we do). Or imagine that his life is punctuated by frequent amnesias, brain-washings, psychoanalyses, conversions, and what not, each one of which is almost (but not quite) enough to turn him into a different person.

Suppose, for simplicity, that any two stages of Methuselah that are separated by no more than 137 years are R-related; and any two of his stages that are separated by more than 137 years are not R-related. (For the time being, we may pretend that R-relatedness is all-or-nothing, with a sharp cutoff.)

If the R-relation and the I-relation are the same, this means that two of Methuselah's stages belong to a single continuant person if and only if they are no more than 137 years apart. (Therefore the whole of Methuselah is not a single person.) That is the case, in particular, if continuant persons are maximal R-interrelated aggre-

gates. For if so, then segments of Methuselah are R-interrelated if and only if they are no more than 137 years long; whence it follows that all and only the segments that are exactly 137 years long are maximal R-interrelated aggregates; so all and only the 137-year segments are continuant persons.

If so, we have intransitivity both of the R-relation and of the I-relation. Let S_1 be a stage of Methuselah at the age of 400; let S_2 be a stage of Methuselah at the age of 500; let S_3 be a stage of Methuselah at the age of 600. By hypothesis S_1 is R-related to S_2 , and S_2 is R-related to S_3 , but S_1 and S_3 are not R-related. Being separated by 200 years, they have no direct mental connections. Since S_1 and S_2 are linked by a 137-year segment (in fact, by infinitely many) they are I-related; likewise S_2 and S_3 are I-related. But S_1 and S_3 are not linked by any 137-year segment, so they are not I-related. The R-relation and the I-relation are alike intransitive.

The problem of overpopulation is infinitely worse in the case of Methuselah than in the cases of fission or fusion considered hitherto. Methuselah spends his 300th birthday alone in his room. How many persons are in that room? There are infinitely many different 137-year segments that include all of Methuselah's stages on his 300th birthday. One begins at the end of Methuselah's 163rd birthday and ends at the end of his 300th birthday; another begins at the beginning of his 300th and ends at the beginning of his 437th. Between these two are a continuum of other 137-year segments. No two of them are identical. Every one of them puts in an appearance (has a stage) in Methuselah's room on Methuselah's 300th birthday. Every one of them is a continuant person, given our supposition that Methuselah's stages are R-related if and only if they are no more than 137 years apart, and given that continuant persons are all and only maximal R-interrelated aggregates of person-stages. It begins to seem crowded in Methuselah's room!

Tensed identity to the rescue once more. True, there are continuum many nonidentical continuant persons in the room. But, counting by the appropriate relation of tensed identity, there is only one. All the continuum many nonidentical continuant persons are identical-at-the-time-in-question, since they all share the single stage at that time. Granted that we may count by tensed identity, there is no overcrowding.

DEGREE

We turn now to the question of degree. Identity certainly cannot be a matter of degree. But the I-relation is not defined in terms of identity alone. It derives also from personhood: the property of being a continuant person. Thus personal identity may be a matter of degree because personhood is a matter of degree, even though identity is not. Suppose two person-stages S_1 and S_2 are stages of some one continuant that is a person to a low, but not negligible, degree. Suppose further that they are not stages of anything else that is a person to any higher degree. Then they are I-related to a low degree. So if personhood admits of degree, we have no discrepancy in formal character between the I-relation and the R-relation.

Parfit suggests, for instance, that if you fuse with someone very different, yielding a fusion product mentally halfway between you and your partner, then it is questionable whether you have survived. Not that there is a definite, unknown answer. Rather, what matters in survival—the R-relation—is present in reduced degree. There is less of it than in clear cases of survival, more than in clear cases of nonsurvival.⁸ If we want the I-relation and the R-relation to coincide, we may take it that C_1 and C_2 (see fig. 1.1 for cases of fusion) are persons to reduced degree because they are broken by abrupt mental discontinuities. If persons are maximal R-interrelated aggregates, as I claim, that is what we should expect; the R-relations across the fusion point are reduced in degree, hence the R-interrelatedness of C_1 and C_2 is reduced in degree, and hence the personhood of C_1 and C_2 is reduced in degree. C_1 and C_2 have less personhood than clear cases of persons, more personhood than continuant aggregates of stages that are clearly not persons. Then S and S_1 , or S and S_2 , are I-related to reduced degree just as they are R-related to reduced degree.

Personal identity to reduced degrees is found also in the case of Methuselah. We supposed before that stages no more than 137 years apart were R-related while states more than 137 years apart were not. But if the R-relation fades away at all—if it is a relation partly of connectedness as well as continuity—it would be more realistic to suppose that it fades away gradually. We can suppose that stages within 100 years of each other are R-related to a high

enough degree so that survival is not in doubt; and that stages 200 or more years apart are R-related to such a low degree that what matters in survival is clearly absent. There is no significant connectedness over long spans of time, only continuity. Then if we want the R-relation and the I-relation to coincide, we could say roughly this: 100-year segments of Methuselah are persons to a high degree, whereas 200-year segments are persons only to a low degree. Then two stages that are strongly R-related also are strongly I-related, whereas stages that are weakly R-related are also weakly I-related. Likewise for all the intermediate degrees of R-relatedness of stages, of personhood of segments of Methuselah, and hence of I-relatedness of stages.

It is a familiar idea that personhood might admit of degrees. Most of the usual examples, however, are not quite what I have in mind. They concern continuants that are said to be persons to a reduced degree because their stages are thought to be person-stages to a reduced degree. If anyone thinks that the wolf-child, the "dehumanized" proletarian, or the human vegetable is not fully a person, that is more because he regards the stages themselves as deficient than because the stages are not strongly enough R-interrelated. If anyone thinks that personhood is partly a matter of species membership, so that a creature of sorcery or a freak offspring of hippopotami could not be fully a person no matter how much he resembled the rest of us, that also would be a case in which the stages themselves are thought to be deficient. In this case the stages are thought to be deficient not in their intrinsic character but in their causal ancestry; there is, however, nothing wrong with their R-interrelatedness. A severe case of split personality, on the other hand, does consist of perfectly good person-stages that are not very well R-related. If he is said not to be fully a person, this *is* an example of the kind of reduced personhood that permits us to claim that the R-relation and the I-relation alike admit of degrees.

Let us ignore the complications introduced by deficient person-stages. Let us assume that all the stages under consideration are person-stages to more or less the highest possible degree. (More generally, we could perhaps say that the degree of I-relatedness of two stages depends not on the absolute degree of personhood of the continuant, if any, that links them; but rather on the relative

degree of personhood of that continuant compared to the greatest degree of personhood that the degree of person-stage-hood of the stages could permit. If two wolf-child-stages are person-stages only to degree 0.8, but they are stages of a continuant that is a person to degree 0.8, we can say that the stages are thereby I-related to degree 1.)

If we say that a continuant person is an aggregate of R-inter-related person-stages, it is clear that personhood admits of degree to the extent that the R-relation does. We can say something like this: the degree of R-interrelatedness of an aggregate is the minimum degree of R-relatedness between any two stages in the aggregate. (Better: the greatest lower bound on the degrees of R-relatedness between any two stages.) But when we recall that a person should be a maximal such aggregate, confusion sets in. Suppose we have an aggregate that is R-interrelated to degree 0.9, and it is not included in any larger aggregate that is R-interrelated to degree 0.9 or greater. Suppose, however, that it is included in a much larger aggregate that is R-interrelated to degree 0.88. We know the degree to which it qualifies as an R-interrelated aggregate, but to what degree does it qualify as a maximal one? That is, to what degree does it qualify as a person, if persons are maximal R-inter-related aggregates? I am inclined to say: it passes the R-inter-relatedness test for personhood to degree 0.9, but at the same time it flunks the maximality test to degree 0.88. Therefore it is a person only to degree 0.02!

This conclusion leads to trouble. Take the case of Methuselah. Assuming that R-relatedness fades out gradually, every segment that passes the R-interrelatedness test to a significant degree also flunks the maximality test to almost the same degree. (If the fade-out is continuous, delete "almost.") So *no* segment of Methuselah passes both tests for personhood to any significant degree. No two stages, no matter how close, are stages of some *one* continuant that is a person to high degree. Rather, nearby stages are strongly I-related by being common to many continuants, each one of which is strongly R-interrelated, is almost as strongly non-maximal, and therefore is a person only to a low degree.

We might sum the degrees of personhood of all the continuants that link two stages, taking the sum to be the degree of I-relatedness of the stages.

But there is a better way. Assume that R-relatedness can come in all degrees ranging from 0 to 1 on some scale. Then every number in the interval from 0 to 1 is a possible location for an arbitrary boundary between pairs of stages that are R-related and pairs that are not. Call every such number a *delineation* of this boundary. Every delineation yields a decision as to which stages are R-related. It thereby yields a decision as to which continuants are R-inter-related; a decision as to which continuants are included in larger R-interrelated aggregates; a decision as to which continuants are persons, given that persons are maximal R-interrelated aggregates; and thence a decision as to which stages are I-related. We can say that a certain continuant is a person, or that a certain pair of stages are I-related, *relative to* a given delineation. We can also say whether something is the case relative to a set of delineations, provided that all the delineations in the set agree on whether it is the case. Then we can take the degree to which it is the case as the size (more precisely: Lebesgue measure) of that set. Suppose, for instance, that two stages count as I-related when we set the cut-off for R-relatedness anywhere from 0 to 0.9, but not when we set the cut-off more stringently between 0.9 and 1. Then those two stages are I-related relative to delineations from 0 to 0.9, but not relative to delineations from 0.9 to 1. They are I-related to degree 0.9—the size of the delineation interval on which they are I-related. Yet there may not be any continuant linking those stages that is a person to degree more than 0. It may be that any continuant that links those stages is both R-interrelated and maximal only at a single delineation. At any more stringent delineation, it is no longer R-interrelated; while at any less stringent delineation it is still R-interrelated but not maximal.

The strategy followed here combines two ideas. (1) When something is a matter of degree, we can introduce a cutoff point. However, the choice of this cutoff point is more or less arbitrary. (2) When confronted with an arbitrary choice, the thing to do is not to make the choice. Rather, we should see what is common to all or most ways (or all or most reasonable ways) of making the choice, caring little what happens on any particular way of making it. The second idea is van Fraassen's method of supervaluations.⁹

On this proposal the I-relation admits of degree; and further, we get perfect agreement between degrees of I-relatedness and degrees

of R-relatedness, regardless of the degrees of personhood of continuants. For at any one delineation, two stages are R-related if and only if they belong to some one maximal R-interrelated aggregate; hence if and only if they belong to some one continuant person; hence if and only if they are I-related. Any two stages are R-related and I-related relative to exactly the same set of delineations. Now if two stages are R-related to a degree x , it follows (given our choice of scale and measure) that they are R-related at all and only the delineations in a certain set of size x . Therefore they are I-related at all and only the delineations in a certain set of size x ; which means that they are I-related to degree x . The degree of I-relatedness equals the degree of R-relatedness. In this way personal identity can be just as much a matter of degree as the mental continuity or connectedness that matters in survival.

PERRY'S TREATMENT OF FISSION

It is instructive to contrast my way and John Perry's way¹⁰ of overcoming the seeming discrepancies in character between personal identity and mental continuity or connectedness. Perry and I have the same goals, but our priorities differ. Perry does not need to resort to tensed identity to rescue the common opinion that in fission there is only one person beforehand. However, Perry's way does not permit identification of the R-relation and the I-relation themselves, but only of certain time-dependent subrelations thereof. Further, he must introduce an unintuitive discrimination among the persons who exist at (have stages at) any given time. Some of them (all, except in the problem cases) are classified as *determinable* at that time. These are the ones who count. There may be others, not determinable at that time, who are left out of consideration for certain purposes.

Say that stage S_1 is *R-related at time t*—for short, *R_t-related*—to stage S_2 if and only if stages S_1 and S_2 are R-related simpliciter, and also S_2 is located at time t . The R_t -relation, then, is the R-relation between stages at t and stages at other times (or at t).

Say that stage S_1 is *I-related at time t*—for short, *I_t-related*—to stage S_2 if and only if both S_1 and S_2 are stages of some one continuant person who is determinable at time t , and S_2 is located at

time t . The I_t -relation, then, is the I-relation between stages at t and stages at other times (or at t), if we leave out any continuant persons who are not determinable at t .

Perry proposes that something C is a continuant person determinable at t if and only if, for some person-stage S located at t , C is the aggregate comprising all and only the stages R_t -related to S . A continuant person, in general, is a continuant person determinable at some time. (No one is doomed to permanent indeterminability.) If something is a continuant person according to this proposal, Perry calls it a *lifetime*. If something is a continuant person according to my proposal—that is, if it is a maximal R-interrelated aggregate of person-stages—Perry calls it a *branch*. In normal cases, all and only lifetimes are branches.

In a case of fission, however, some lifetimes are not branches (see fig. 1.1 for cases of fission). Branch C_1 is a lifetime determinable at t_1 , since it comprises all and only the stages R_{t_1} -related to S_1 . Likewise branch C_2 is a lifetime determinable at t_1 . But C —the whole thing—though not a branch, is a lifetime determinable at t_0 , since it comprises all and only the stages R_{t_0} -related to S . Note that C_1 and C_2 are not yet determinable at t_0 , whereas C is no longer determinable at t_1 .

On Perry's proposal, the R-relation is not the same as the I-relation in this case. Since C is a lifetime, and hence according to Perry a continuant person, S_1 and S_2 are I-related. However, they are not R-related.

What does follow from Perry's proposal is that, for any time t , the R_t -relation is the same as the I_t -relation. Perhaps that is good enough. Any particular question of survival, or of personal identity in general, arises at some definite time. If the question arises at time t , it is the R_t -relation and the I_t -relation that are relevant. We want them to give the same answer. The rest of the R-relation and the I-relation are not involved. In particular, it is harmless that S_1 and S_2 are I-related, since they are neither I_{t_0} -related nor I_{t_1} -related, nor indeed I_t -related for any time t whatever.

On Perry's proposal, any person-stage existing at any time must belong to exactly one continuant person who is determinable at that time. Persons can share stages, to be sure. More so on Perry's proposal than on mine, in fact: stage S in the fission case belongs to three lifetimes (C , C_1 , and C_2) but only two branches (C_1 and

C_2). Stage S_1 belongs to two lifetimes (C and C_1) but only one branch (C_1). But Perry's persons share stages only when all but one of the sharers is not determinable. Therefore we can count by identity, counting only the persons determinable at the time, and we will get the right answer. One determinable person (counting by identity) exists before the fission, but two exist afterward. There are three all along, counting by identity but including the non-determinables; but at the fission one loses determinability and the other two gain it.

I grant that counting by tensed identity is somewhat counter-intuitive; but isn't excluding the nondeterminable persons just as bad? They *are* (timelessly speaking) persons; they *do* exist at (have stages at) the time; they are *not* identical to persons we are counting. If we want to count the persons at the time, is it not gratuitous to exclude them? Perry can say: Yes, but we just do. Or: we do it for excellent practical reasons. I will say the same about counting by tensed identity without any exclusions. Both are counterintuitive; neither is unbearably so; either is better than not having any way to count that gives the correct answer; either is better than permitting the possibility of fission to create a discrepancy between personal identity and what matters in survival.

Perry considers only fission and fusion, but his proposal can apply also to the case of Methuselah. I do not know whether Perry would wish so to apply it. He might prefer to let mental continuity predominate over connectedness in the R-relation, so that the whole of Methuselah is both a branch and a lifetime, and thus an unproblematic person.

Suppose as before, however, that the R-relation fades out with an (arbitrary) cutoff at 137 years. For me, the 137-year segments (the branches) are the continuant persons; for Perry, the 274-year segments (the lifetimes) are the continuant persons. For instance, a segment that begins on Methuselah's 420th birthday and ends at the same time on his 694th comprises all and only the stages R_t -related to a certain stage S on his 557th, t being the time of that stage. The lifetimes are not branches and the branches are not lifetimes. (With a trivial exception: the initial and final 137-year segments are both branches and lifetimes. More generally: the initial and final lifetimes are shorter than the others, being cut off by birth or death.) Any stage at any time belongs to exactly one per-

son determinable at that time, and to infinitely many nondeterminable persons. Counting by identity gives the right answer, provided the nondeterminable hordes are left out. The R_t -relation and the I_t -relation are the same for any time t , but the R-relation and the I-relation disagree for any two stages separated by more than 137 years but no more than 274.

Perry says nothing about degrees of personal identity. However, there is nothing to prevent him from taking over all I have said. If the R-relation admits of degree, then so does personhood, no matter whether continuant persons are branches or lifetimes. Then the I_t -relations also admit of degree, and there is no obstacle here to identifying them with the corresponding R_t -relations.

I have one serious misgiving about Perry's treatment of the problem. Perry has concentrated on making things come out as they should from the standpoint of any particular time, provided that persons not then determinable are not counted among the persons existing at that time. But what shall we do when we wish to generalize over persons existing at various times? Exclusion of the nondeterminables requires a definite point of reference, which is lacking. Overpopulation sets in again. Of course my cure for overpopulation—counting by tensed identity—also requires a definite point of reference. But let us count by identity, if we count from the standpoint of no definite time. How many persons were involved in an episode of fission long ago? I say: two. Perry says: three. Or else he says: none now determinable. Isn't two the correct answer?

NOTES

1. Better, *quasi-memory*: that process which is memory when it occurs within one single person, but might not be properly so-called if it occurred in a succession of mental states that did not all belong to a single person.
2. Derek Parfit, "Personal Identity," *Philosophical Review* 80 (1971), 3-27.
3. Unless time is circular, so that it is in its own future in the same way that places are to the west of themselves. But that possibility also has nothing to do with survival.
4. It does not matter what sort of "aggregate." I prefer a mereological sum, so that the stages are literally parts of the continuant. But a class of stages would do as well, or a sequence or ordering of stages, or a suitable function from moments or stretches of time to stages.
5. The least clear-cut cases are those in which the stages cannot be given any "personal time" ordering with respect to which they vary in the way that the

stages of an ordinary person vary with respect to time. But it is so indeterminate what we want to say about such bizarre cases that they cannot serve as counter-examples to any of my claims.

6. The argument also takes it for granted that every person-stage is a stage of at least one person. I do not object to that. If there is no way to unite a stage in a continuant with other stages, let it be a very short-lived continuant person all by itself.

7. As before, it would be better to speak here of quasi-memory; and likewise of quasi-intentional control.

8. No similar problem arises in cases of fission. We imagine the immediate postfission stages to be pretty much alike, wherefore they can all be strongly R-related to the immediate prefission stages.

9. See Bas van Fraassen, "Singular Terms, Truth-Value Gaps, and Free Logic," *Journal of Philosophy* 63 (1966), 481-495. See also the discussion of vagueness in my "General Semantics," *Synthese* 22 (1970), 18-67.

10. John Perry, "Can the Self Divide?," *Journal of Philosophy* 69 (1972), 463-488.

II

SURVIVAL

GEORGES REY

I

The philosophical problem of personal identity can seem a matter of life and death. For what matters to us in our personal survival seems to involve, partly because in our experience it always has involved, the preservation of at least our bodily identity over time.

The supposition that it does, however, the supposition that what matters is some form of identity, is susceptible to certain intractable logical difficulties arising from some recent results in neurophysiology. The Sperry experiments¹ on epileptics whose *Corpora Collosa* have been cut present fairly persuasive evidence that the human brain exists as a pair of very similar hemispheres, each one of which could in principle exist and (with a little tampering) function fully independently of the other. Only technological (and perhaps some moral) difficulties prevent a brain being divided into two, one hemisphere being transplanted to one new skull, the other to another. In such a case, our usual criteria of personal identity—bodily² or psychological continuity—would break down. For they would present us with two (over time) equally eligible, but (at a given time) bodily and psychologically quite distinct candidates for the continued identity of the original person. And that would involve a violation of the transitivity of that relation: the original person could not be identical with both of the resulting persons without both of the resulting persons being, as they fairly clearly are not,³ identical with each other. On the other hand, whatever it is that matters to us in our personal survival would seem to be preserved between the original and each of the resulting persons. There is no reason to suppose there to be at any