Objects and Identity in Time

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I could have started this sentence in a different way. I could have even written no sentence at all, but I did, in fact, write one, and I wrote it in a particular way and not in any other. Talking about the first sentence that I actually wrote, and the possibility that I could have written it some other way, or not at all, can be done with the help of a simple version of possible-world theory. Everything that actually happens—my writing of the first sentence the way I actually wrote it, for example—happens in the actual world. Everything that can possibly happen, but does not actually happen, occurs in some possible world, each distinct possibility occurring in a different possible world. So for each possible way I could have dealt with myself and my surroundings while writing the first sentence, there exists a possible world in which it occurred. Because no two possible ways I could have acted can be the same (otherwise they would not be two possible ways, but one), the two possible worlds in which the two possible ways occurred cannot be regarded as one and the same world. This should be clear. However, how to identify the objects involved in each case, in each possible world, and in the case of the actual world, is not so clear. This is the problem I will address. I will also explain how material objects can maintain consistent identities through time. I do not know of any particular philosopher who would agree with the account of identity I will give, but my account will at times rely heavily on the distinction Saul Kripke makes between rigid and nonrigid designation in "Identity and Necessity."

To distinguish between rigid and nonrigid designation, I will consider the identity of Martin Klaproth, the German chemist who is credited with discovering elemental uranium. Supposing that Martin Klaproth really was the first to discover elemental uranium, when I give the expression "the discoverer of elemental uranium," it designates a particular object, namely, Martin Klaproth. However, it is only a contingent fact that Klaproth actually discovered elemental uranium. We can imagine that under different

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circumstances someone else would have discovered elemental uranium before Klaproth did, and if that would have been the case, someone else would be the object designated by "the discoverer of elemental uranium." Expressions like this one, which designate a particular object, but only under certain circumstances, Kripke calls "nonrigid" (77).

A "rigid designator" is a term that, as *we* use it, designates the same object in all possible worlds. An example of a rigid designator is "the sum of three and seven." This expression designates the number ten, and can be proven mathematically. Since that which is provable mathematically is necessary, it is necessary that "the sum of three and seven" designates the number ten. Since the sum of three and seven is necessarily ten, there is no possible world in which "the sum of three and seven" does not designate the number ten. Someone may suggest that this expression could have designated something that is not the number ten because we chose the sounds and symbols of our language contingently. But it cannot be decided whether a designator is rigid or nonrigid before it is used. If our language had been different, yet we held the same beliefs about mathematics, we might not have used "the sum of three plus seven" to designate rigidly the number ten; however, there would have been some other expression meaning what we mean by "the sum of three plus seven" which, once chosen, would have rigidly designated the number ten.

It seems clear, then, that at least one abstract object, the number ten, can be rigidly designated.[1] What is not so clear is whether the same can be true of any material object. Let us consider a simple material object: a new number two medium soft pencil. Let us call a particular new number two medium soft pencil "Penny." Now that there is a designator for this particular material object, we can consider whether there could have been some other object satisfying the conditions of the designator "Penny," which have been set in relation to a particular pencil. Suppose that the store from which Penny was bought had been out of number two medium soft pencils. Suppose that I bought a number two *soft* pencil instead. Can this number two soft pencil satisfy the conditions of the designator "Penny"? It seems it cannot. The object we designated "Penny" is not a number two soft pencil, but a number two medium soft pencil, so no number two soft pencil can be the object designated by "Penny," for the object so designated is not soft, but medium. In fact, supposing I had purchased some other pencil (whatever number, whatever softness) besides the one I actually purchased and designated "Penny," I could not say of it that it could be Penny. I am not saying that I could not have called anything but a particular number two medium soft pencil "Penny," but rather that once I used "Penny" to designate

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[1] And it seems that all real numbers can be rigidly designated.

a particular object, only that particular object could be the object designated "Penny." Since "Penny" does not refer to an object contingently (like "the discoverer of elemental uranium" does), but rather necessarily (like "the sum of three plus seven" does), "Penny" is a rigid designator. So it would seem that material objects can be designated rigidly.

Whatever is an object is necessarily self-identical, so Penny the pencil as a material object is necessarily self-identical. We can imagine that in some possible world there exists a number two medium soft pencil having every property that Penny has in the actual world, and we can refer to that number two medium soft pencil in some possible world as "Penny" in virtue of its having every property Penny has in the actual world. Now I must note, this is taking a view of possible world theory that is not as robust as some may prefer.[2] However, I agree with Kripke that it is misguided to say that some object in some possible world cannot be the *same* object as some object in the actual world. I do not discuss here why this is so.

Suppose that when I designate the new number two medium soft pencil "Penny," it is still unsharpened. Now suppose that after I have named Penny, I sharpen Penny. Once the tip of Penny is sufficiently sharp I notice there are more pencil shavings in the waste container of the pencil sharpener than before. I have good reason to assume that the new shavings must have been shavings of Penny, which might entail that some of what Penny was is not part of what is now Penny. We do not call the number two soft pencil I might have otherwise bought "Penny" because it has *at least* one property not shared by Penny, that of being soft instead of medium soft. To say that they are the same object would deny that an object is necessarily self-identical. But in the case of Penny being sharpened, after parts of it have been shaven off, we still call it "Penny" even though the properties of Penny sharpened are not identical to those of Penny unsharpened. But must not an object be self-identical if it is an object at all? Accounting for such flexibility allowed to the set of properties of a rigidly designated object through time is a problem we face with identifying material objects. This is not a problem we face with abstract objects such as numbers. The number ten, for example, does not change; ten could never be pushed through a pencil sharpener, filling the sharpener with shavings of number. There has never been a time when ten had one more or one fewer property than it once had or will have.[3] Its properties are forever consistent.

[2] Most notably, David Lewis.

[3] This is assuming that any possible discovery regarding ten itself or some relation of it to some other object does not change ten itself, but rather only changes our understanding of it. This is, after all, what justifies an elementary school teacher's marking a student's answer "ten" to the question "one plus zero equals?" incorrect, regardless of the student's opinion of what the number ten really is.

We can imagine being able to observe Penny as it exists in a single instant. By an "instant" I mean a period of time too short for the occurrence of any physical change, so that we observe Penny as an object in which not a single change occurs. If we could acquire the results of a comparative analysis of the set of properties of Penny in this instant in time and the set of properties of itself in the same instant, there would obviously not be a single discrepancy between the two sets of properties. In terms of their physical location, origin and physical constitution, they are identical, and thus the same object. Suppose that this instant in time in which Penny has been observed is an instant in time before Penny was sharpened, and that we can compare Penny in this instant to Penny in some instant after Penny has been sharpened. If the properties of these two objects were compared, it is obvious that there would be many discrepancies. And if we are committed to an object's being necessarily self-identical, any one of the individual discrepancies on the list would be enough to conclude that they are not one and the same object. It seems that at any given instant, an object is identical to itself at that instant, and is so necessarily; however, if the object is a material object, it is not itself in two different instants.[4] Thus, the material object cannot possibly exist for more than an instant.[5] If this is correct, I cannot be saying anything true if I refer to a material object existing through time. I can only refer to a material object in some theoretical sense, as physical objects existing only in instants of time. This is because material objects do not remain self-identical through time; the property sets of material objects are constantly disappearing, giving rise to new, previously non-existent sets of properties.[6] If this is correct, it would seem that I might only use "Penny" (a rigid designator) to rigidly designate Penny (a material object) if I realize that Penny exists for only a period of time too brief for me to actually observe. By the time I finish uttering "Penny," regardless of how quickly I speak, the material object I am attempting to rigidly designate would no longer exist.

If this is the nature of material objects, if material objects are only the kind of thing we can imagine observing in single instants, then material

[4] This is assuming that the two points are far enough apart that at least some subatomic activity occurs between them.

[5] It seems that for this not to be the case, some material object would have to exist at absolute zero, which nothing composed of matter can do.

[6] I suppose quarks and leptons might still exist as self-identical entities through time, but even if they do, the point I am trying to make is that in almost all cases, at least in all cases of material objects in the macroscopic world, material objects do not exist as self-identical objects. And by "self-identical entities through time," I mean that the entity that exists at time A is absolutely the same entity that exists at some later time B.

objects are things extraordinarily different from what I call material objects. What I call material objects exist through time, but material objects, as they have just been described, do not. Rather than acknowledging that material objects are the kind of objects described above, I acknowledge that objects of the kind described above do exist; they are not what I normally call material objects. I propose that material objects are somewhat abstract. I am not sure whether I could imagine something sounding more paradoxical, but I will attempt to explain the identity of material objects in a way that allows for this, without entailing any significant changes to how we actually interact with the external world. Penny can still be Penny even after it has been sharpened. I will hereafter refer to the kind of object that exists as a self-identical physical object in some instant, not as a material object, but as an object*.

What we call material objects are constantly changing. Change in material objects involves the repeated function of an object* losing or gaining at least one property, thus resulting in a new object*. I will call the initial object* "object* A" and say that when object* A loses or gains at least one property, "object* A" no longer refers to any object that exists in actuality, and that each resulting object* can be designated individually—"object* B," for example. When we observe a material object, we are taking in a very general view of the object*-to-object* process occurring. If we could actually observe, for example, some object* A, and compare it to object* B, an object* coming into existence in sequence after object* A, we might have only the object*s' dissimilar properties at the molecular level to account for their differing identities. The new object* might be perceptively indistinguishable from the last. This process may occur for long periods of time without our noticing any sort of change in the material objects from one instant to the next, even if the instants in time are separated by days, weeks, or years.

If we maintain that material objects are self-identical, non-abstract objects through time, then Penny could not actually be Penny for more than an instant. However, if we view material objects as the particular object*-sequencing over time, as a series of object*s with one and only one representative object* existing at each instant in which the corresponding material object exists, material objects may then be treated as self-identical objects. So far, this is helplessly vague. It may help to consider that identifying a material object and the individual object*s it is composed of is perhaps similar to how we already identify a streaming film image on-screen[7] and the individual, on-screen images of which it is composed.

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[7] The term "on-screen" is used to distinguish the image on-screen, as opposed to the image on the actual reel. This analogy will not work for non-reeled, digital film.

While viewing a motion picture—*Back to the Future*, for example—we view it as a whole, yet we know that the moving image on-screen is not actually a single image, but rather a long sequence of individual on-screen images, streaming too quickly for us to possibly distinguish one from another. This rapid sequence results in the experience of the on-screen image sequence in time as a single, yet changing entity. As *Back to the Future* plays in the theatre, the viewers do not identify in time the individual, static, on-screen images themselves that constitute the on-screen visual sequence of the Delorian accelerating to eighty-eight mph. The images comprised by this sequence do not individually show motion, but streaming the sequence at twenty-four images per second, a sequence too fast for the human eye to track, one views a motion picture, not its individual images—such as the Delorian accelerating to eighty-eight mph.

Unlike the image sequence of a motion picture, we cannot stop time and view the object*s standing for each material object at a particular instant in the object*-to-object* sequences. With a motion picture, we can stop the stream, allowing us to view the individual on-screen image standing for the motion picture at a particular point in the image sequence. We can stop *Back to the Future* at some particular image, identify it, then view the particular image that comes after it, identify it, etc. However, just as a motion picture is not one of its individual, static, on-screen images, but is instead the individual on-screen images together in sequence through time, a material object is not one of its object*s, but rather it is the object*s together in sequence through time that constitute the material object. Viewing the object* that stands for Penny unsharpened in some point at time, alongside the object* that stands for Penny sharpened at some later point in time would be like viewing two individual on-screen images from the on-screen image-sequence composing *Back to the Future* alongside each other. In this sense, pointing to Penny is like pointing to *Back to the Future* as it rolls at twenty-four fps.

The structure of a material object identity, then, is similar in some ways to the structure of a motion picture. However, attempting to more closely relate the structure of material object identity to the structure of motion pictures is probably unhelpful. It is a loose relation. I am not interested in trying to liken anything about the structure of a material object to the role that the actual images comprising the motion picture's actual film reel play, or to the film reel itself, or to the projector. I will hereafter continue to speak of the sequential structure of material objects, but will not attempt to identify any further similarities this structure might have to that of motion pictures.

When does a material object cease to exist? It ceases to exist when there is no object* to sustain its existence. When is there no object* to

sustain the existence of a material object? There is a set of properties that some object* must include for it to stand for a particular material object. The question of which properties constitute the individual sets of particular material objects is not one I think needs to be discussed immediately. What is important is that whatever properties are selected as the set which an object* must include remains consistent and avoids contradictions. Beyond remaining consistent and staying free of contradictions, deciding which properties to include in a particular material object's set of properties seems to be a purely pragmatic concern. However, just as an object* must exist to stand for a material object, for that material object to *continue* existing, an object* must also exist to allow for the designation of identity to a material object for which the object* can stand.

How do we find an object* to stand for a material object? We do not. It is not possible for us to identify an individual object* as it exists in the world. But as one object* ceases to exist, the matter of which it had been composed does not. The matter of which it had been composed is redistributed, creating new object*s. However, it would seem that when these new object*s are formed, in most cases, one of the new object*s is nearly identical to the preexisting object*—possibly, the only difference being the presence or absence of a few atoms. The number two medium soft pencil we rigidly designated "Penny" was a designation we were able to make because an already existing sequence of object*s was identifiable. This means the following: (1) the matter composing an object* that satisfies whatever set of properties one might consider as the necessary set of properties for an object* to be a pencil is redistributed into new object*s; (2) one of the new object*s satisfies the set of properties the preexisting object* had satisfied in order to be a pencil; and (3) this pattern must have continued long enough for there to be such an object* in each instant of time, long enough for the pattern to be identified and rigidly designated "Penny." If Penny is thrown into a fire, eventually not one of the object*s created will have in its set of properties the set of properties required to stand for Penny.

We can designate one object* "object* A" and the object* that results from object* A's losing or gaining at least one property, yet standing in place in time for the same material object for which object* A stood, as "object* B." The identity designation of "object* B" to object* B, as well as "object* A" to object* A, are rigid designations. To show that this is the case, we will consider object* B's relation to object* A. We can assume that there has always existed some object* and that the relation object* A stands in to the object* that came before it is the same kind as that in which object* B stands to object* A. And I will suppose that object* A and object* B are object*s in the object*-sequence history of Penny. It was not necessary that the object* that resulted from object* A be the object* that actually

resulted. Things could have been different. On a grand scale we can talk about pencil sharpening and that at some point while the pencil was being sharpened, one of the electrons in object* A moved to a location it would not have otherwise moved to had the pencil not been in the sharpener.[8] The expression "the object* that resulted from object* A" designates object* B in this case, but it does so contingently. Had things been different, some other object* may have resulted, one not identical to object* B. Thus "the object* that resulted from object* A" is a nonrigid designator. However, once object* B did result, it was the object* that actually resulted from object* A, and we designated it "object* B." The only possible object that can correspond to "object* B," once designated, is object* B. So "object* B" is a rigid designator.

The concept of material objects as the sequence of corresponding object*s coming in and out of existence through time does not, in any way, predetermine the manner in which the involved matter is redistributed through time. No restraints are put on the physical world by our identifying its content. Calling the number two medium soft pencil "Penny" is a rigid designation. The object*-sequence corresponding to Penny, the history of it, is fundamental in forming the identity of Penny. When one object* corresponding to Penny results in a new object* corresponding to Penny, the old object* does not still exist. However, the old object* was, in the instant it existed, the object* that stood for Penny, and the sequence of object*s that stand for Penny cannot be changed retroactively. This actual history cannot be changed. The object*s composing the sequence of Penny stood for only Penny and no other material object. And only one object* can stand for a particular material object at any given instant in time. Now, perhaps there exist two object*s at some point in time that are constitutionally identical, but if that is the case, they are still two object*s. This is because they occupy two different locations in space, and two object*s existing at the same instant in time cannot both stand for one material object in that instant. And since we can rigidly designate the two object*s, we are able to keep material identity objects separate, even if two material objects, at some point in time, are corresponding to two constitutionally identical object*s. No material object has the same sequence history as another material object. Because of this difference, an object in some possible world that has the same object*-sequence history of some material object in the material world is the same object. The object in some possible world that has the same object*-sequence history as Penny is Penny in that

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[8] This example is deficient for the fact that object* A would not have existed in the first place had the pencil not been in the sharpener, but surely the contingent fact that the pencil was in the sharpener necessarily affected what sorts of objects* are comprised by the sequence.

possible world. Thus, material objects, like object*s and numbers, can be rigidly designated.

I will summarize this view by showing how it would work for an identity that Kripke tries to sort out in "Identity and Necessity." This identity is Richard Nixon, the former president, had he been able to get Carswell through. Kripke says that when we ask what might have happened had Nixon gotten Carswell through, we are speaking of Nixon himself, and that had Nixon gotten Carswell through, Nixon would have still been Nixon. Kripke says that Nixon could not have literally been a different person from the person he in fact was, even though the thirty-seventh president might have been Humphrey. "Nixon" is a rigid designator while "the thirty-seventh president" is nonrigid (83).

Rather than go point by point with Kripke, I will offer my version, which shows that Nixon would not have been the same person he actually became, had he done something different than what he did in actuality (get Carswell through). But first, I must make the obvious note that with Richard Nixon I am no longer referring to the same kind of object* as Penny. It is certainly worth acknowledging that there are some very significant differences between an object* with a mind and an object* without, but this account, I believe, avoids entanglement with that distinction.

I will suppose that at some time relatively near the time Nixon might have gotten Carswell through, the object* that corresponded to Richard Nixon was object* N. I will further suppose that at some instant in time after Nixon might have gotten Carswell through, but actually did not, the object* corresponding to Richard Nixon was object* A. And I will suppose that at the instant at which Nixon was object* A in the actual world, Nixon got Carswell through in some possible world, and that this object* corresponding to Richard Nixon at the possible world was object* P. So, in the actual world, the object*-sequence history corresponding to Richard Nixon eventually went from object* N to object* A. In some possible world in which Nixon got Carswell through, the object*-sequence history corresponding to Richard Nixon went eventually from object* N to object* P.

"Object* N" rigidly designates object* N. Thus when they were both object* N, the man we refer to as Richard Nixon and the man we refer to as the possible Richard Nixon were the same person. Object* N had the potential to be included in sequences resulting either in object* P or in object* A. However, just as "object* N" rigidly designates object* N, "object* P" and "object* A" rigidly designate object* P and object* A, respectively. So we now we are dealing with two different objects*, though both were, at the instant that object* N existed, compatible with the material object called "Richard Nixon." Which one stands for Richard Nixon? I think the answer depends on which world you are in. In the actual world,

object* *A* stood at some point for Richard Nixon, but object* *P* never did. In the possible world in which object* *P* once existed, it is just the reverse.

The object*-sequence history is the determining factor. Any object in any possible world that has the object*-sequence history of the actual Richard Nixon is designated "Richard Nixon" and thus is the same person. We can still say that had Richard Nixon gotten Carswell through, he would still be Richard Nixon. But this does not mean that if he had (object* *P*), he would be identical to Richard Nixon in the actual world (object* *A*). Both object*-sequence histories are compatible with what might have followed from the point when object* *N* stood for Richard Nixon. But once Richard Nixon in the possible world corresponded to a different object* than he did in the actual world, he ceased to have the object*-sequence history of Richard Nixon. If we determine the property of being self-identical as going from the actual object*-sequence history to the possible object*-sequence history and hold the actual object*-sequence history to represent the identity of the material object , a possible object*-sequence history that is different from the actual object*-sequence history cannot identify the same material object. From the point of view of the actual world, while the object* that stood for Richard Nixon (object* *N*) was the object* standing for Richard Nixon in some possible world, when that which stood for Richard Nixon in the possible world (object* *P*) was something different from that which stood for him in the actual world (object* *A*), Richard Nixon no longer existed in the possible world. From the perspective of the actual world, we insist that Richard Nixon is that which he became (object* *A*), not that which he might have become (object* *P*).

Works Cited

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