Interactive Kinds

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ABSTRACT

This paper examines the phenomenon of 'interactive kinds' first identified by Ian Hacking. An interactive kind is one that is created or significantly modified once a concept of it has been formulated and acted upon in certain ways. Interactive kinds may also 'loop back' to influence our concepts and classifications. According to Hacking, interactive kinds are found exclusively in the human domain. After providing a general account of interactive kinds and outlining their philosophical significance, I argue that they are not confined to the human realm, but that they can also occur elsewhere. Hence, I conclude by arguing that interactive kinds pose a challenge to scientific realism about kinds by making it difficult to make a distinction between real and non-real kinds.

1 Introduction

On a broadly realist account of our classificatory practices in science and elsewhere, we proceed as follows. First, we observe that certain properties co-occur in individuals, then we identify these particularly salient clusters of properties as kinds (or 'natural kinds'). After that, we associate these kinds with certain labels or predicates, and we classify individuals and phenomena in accordance with those labels. We go on to refer to these kinds in explanations and inductive inferences while discovering further things about them and acquiring new beliefs about them. On this picture, the kinds that we identify in the world are impervious to our labeling and, more generally, to our classificatory practices and theoretical endeavors. They are indifferent to our concepts of them and our theories about them. Ian Hacking has posed a chal-

lenge to this picture, at least when it comes to some human or social kinds. He has identified a class of human kinds, 'interactive kinds', that are not indifferent to our identifying them, using them in classification and acting on those classifications in certain ways. In fact, they may only be manifested as a result of such actions, and they may also be significantly modified by these actions, thereby 'looping back' and forcing us to revise our classifications and theoretical beliefs. While it may be tempting to regard such kinds as mind-dependent and therefore dismiss them as non-real, I will argue that it is unclear how to make a principled distinction between interactive kinds and paradigmatic real kinds. Though it was not his intention, Hacking's identification of interactive kinds renders it difficult to draw a clear boundary between kinds usually regarded as real and those commonly treated as artifactual or non-real.[1]

In this paper, I will undertake an examination of the phenomenon of interactive kinds identified by Hacking. My aim is to establish the distinctive features that set them apart from indifferent kinds and to determine the philosophical significance of the distinction between interactive kinds and 'indifferent' kinds. In Section 2, I will begin by describing the main characteristics of interactive kinds, based on some of Hacking's paradigmatic examples. Then, in Section 3, I will generalize this account and will make some tentative conjectures as to the philosophical implications associated with interactive kinds. In Section 4, I will try to ascertain whether these kinds are confined to the human or social realm or whether they can occur elsewhere, concluding tentatively that they can. In Section 5, I will argue that awareness and intentional action are not necessary features of the phenomenon of interactive kinds, which lends further support to the claim that they are not necessarily human kinds. Finally, in Section 6, I will try to determine in what sense interactive kinds can be considered to challenge the broadly realist view that I sketched above.

2 The Looping Effect

Before trying to elucidate Hacking's position, it is necessary to agree on some terminology. Hacking tends to use the terms 'kind' and 'category' interchangeably, and he sometimes uses 'category' in such a way that it is ambiguous as to whether it is an entity in the world or a mental item, a concept, or conception.

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[1] It is more common to speak of 'natural kinds' rather than 'real kinds'. By 'real kinds', I mean ones to which one ought to take a realist stance. On many realist accounts of kinds, kinds are mind-independent (i.e. they would have existed without mental states), and their boundaries are not a result of our concepts or beliefs. Although there are many philosophical accounts of what makes a kind natural, I assume that a necessary condition on many accounts of natural kinds is that they are mind-independent and do not arise as a result of our classifications. Thus, natural kinds are a (possibly proper) subset of real kinds, since a necessary requirement for a kind to be natural is that it be (at least) mind-independent.

To avoid confusion, I will consider that a *kind*, whether indifferent or interactive, is or is associated with a cluster of properties that typically co-occur in the world. I will avoid the term 'category' (except in quotation and paraphrase). A kind is an abstract entity, like a property, and it is not extensional: Even though it is exemplified by a set of individuals, it is not identical to that set of individuals. Furthermore, I will say that a *kind* is picked out by a *concept* (or *kind-concept*), which is a psychological or mental entity, and is associated with a *label* (or *predicate*), which is a semantic item.

Hacking thinks that some kinds are such that the act of   inventing labels or predicates corresponding to them is instrumental in bringing them into being or in changing them in significant ways. These changes, in turn, affect our concepts of these kinds or our theoretical beliefs about them. This is what he has called the 'feedback effect' or 'looping effect' of interactive kinds: 'Classification of people and their actions affects the people and their actions, which in turn affects our knowledge about them and classification of them.'([1988], p. 55)

Two of Hacking's most discussed examples of interactive kinds are *multiple personality* and *child abuse*. I will not attempt to summarize his extensive treatments of those kinds, but will try to schematize them in such a way as to bring out their most salient aspects. At the risk of oversimplifying matters, in the case of *multiple personality*, the chain of events initiated by the introduction of the kind-concept and the label can be broken down into the following stages:

(1) Introduction of the concept of *multiple personality* along with the associated label.

(2) Certain people are classified as having *multiple personality* or as falling under that kind and are treated accordingly.

(3) Some of these people come to identify with the kind *multiple personality* (whether consciously or not).

(4) These people (or some of them) become further distinguished from other people, often acquiring new properties.

(5) The kind *multiple personality* comes to be associated with a new set of properties, which leads us to modify our concept of *multiple personality* or the theoretical beliefs associated with it.

The same pattern is repeated in other cases in which new interactive kinds have emerged, though with some important differences. For instance, in the case of a kind such as *child abuser*, the first two steps are similar, but the pattern diverges somewhat when it comes to subsequent steps, thus:

(1) Introduction of the concept of *child abuser* along with its associated label.

(2) Certain people are classified as belonging to the kind *child abuser* and are treated accordingly.

(3) Some of these people reject their being classified into the kind *child abuser*.

(4) These people (or some of them) modify their behaviors so that they no longer fall into the kind *child abuser*.

(5) The kind *child abuser* no longer contains such people, and this leads to a change in the extension of our concept *child abuser*.

In this case, the outcome would seem to be relatively minor, in that it involves a mere change in the extension of our kind-concept, without substantive changes to the theoretical beliefs associated with it. However, one could imagine that the upshot of interaction with kinds such as *child abuse* and *child abuser* might be quite different. Groups opposed to child prostitution might lobby to get it recognized as a form of child abuse, with pimps and others involved in these practices considered child abusers.[2] This would then cause us to alter our views on the types of people who belong to the kinds *child abuser* and *abused child*. The addition of child prostitutes to the catalog of abused children is arguably not a mere extensional expansion but involves a modification of our understanding of the kind *child abuse*, requiring an alteration in some of our associated beliefs about child abuse. Notice that in this case, it is not the people so classified who interact with the concept and label, but others in society. Therefore, although the interaction in question is ordinarily between classifier and classified, on occasion it can occur between the classifiers and others who, in turn, interact with the classified.

3 A General Account of Interactive Kinds

Now that we have looked at some paradigmatic examples of interactive kinds, I will attempt in this section to outline a general account[3] of them and their philosophical implications. Human beings engaged in investigating some phenomenon introduce the concept of a new kind *K* and invent a label for it. The beliefs associated with the kind-concept may be quite minimal at first. There may be some observational basis for introducing the concept, but that does not seem to be strictly necessary. This is followed by an effort to classify certain individuals into kind *K*, an effort which is accompanied by actions that treat them in a kind-appropriate way. At this point, the individuals being classified as *K* react to being classified and acted upon, either by conforming to the

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[2] In fact, Hacking ([1992], p. 218) observes that child prostitution is not commonly included in the category of child abuse.

[3] Hacking is skeptical about the possibility of providing a general account (see e.g. [1986], p. 168).

classification and complying with it, thus effectively exemplifying the kind *K*, or by reacting against it and resisting the classification, or in some other conspicuous way. This can be thought of as the first arc of the 'loop', wherein individuals classified as belonging to *K* interact with our classification. The response on the part of individual members of *K* may be significant enough that it leads us eventually to modify our initial classification or some of the beliefs associated with it. This may be due to the fact that those individuals classified as *K* have shed some of the properties associated with *K* or have acquired new properties, or for some other reason. This in turn forces us to revise our original classification, either by modifying some of the theoretical beliefs associated with *K*, altering the extension of *K*, further distinguishing *K* from other kinds, or in some other significant way. Thus, the second arc of the 'loop' is one in which feedback from kind *K* causes us to adjust our kind-concept or the beliefs associated with it. In the first arc of the loop, we exert an influence on phenomena and effect some change in them; in the second arc, those phenomena go on to evolve in certain ways in response to that influence, leading us to change our conceptions. The looping process can be iterated indefinitely.

This attempt to provide a general outline of the looping effect is not comprehensive, and it may not be possible to anticipate the variety of ways in which interaction and feedback take place. For example, it leaves out cases in which individuals other than those classified as *K* undertake certain changes in response to the new label, either by arguing that the kind should be expanded or narrowed (as in the hypothetical case of child abuse and child prostitution mentioned above). But I would contend that it captures many of the focal cases that Hacking is interested in. In particular, it captures two distinctive features: the interactivity of these kinds and the feedback engendered by them.

Having described the main characteristics of interactive kinds and the looping effect, it is now possible to say, in a tentative fashion, what gives this phenomenon philosophical significance. If Hacking's characterization of interactive kinds is sound, it generates a philosophical challenge to the realist picture I sketched in Section 1: The kinds that exist in the world and their properties seem to depend in part on our classifications. In some cases, merely by conceiving of such kinds and acting on our conceptions, we may bring such kinds into being, which is a type of self-fulfilling prophecy. In other cases, our classifications and associated actions alter the individuals belonging to the kinds or change some of the properties associated with them, which is more like a self-defeating prophecy.

Hacking takes the phenomenon of interactive kinds to vindicate a certain variety of 'nominalism' about these kinds, which he equates with the view that 'the world does not come with a unique prepackaged structure' ([1999],

p. 60).[4] I take this to mean that the kinds of things in the world would have been different had humans made different classificatory decisions. But Hacking sometimes goes further in characterizing this view as a species of 'social constructionism' ([1999], p. 33):

> Constructionists tend to maintain that classifications are not determined by how the world is, but are convenient ways in which to represent it. They maintain that the world does not come quietly wrapped up in facts. Facts are the consequences of ways in which we represent the world.

In this passage, Hacking seems to have gone beyond what he calls 'nominalism' in saying that facts are the consequences of ways in which we represent the world. However, this claim can be squared with the other if we take him to be saying not that representing the world in certain ways can result in changes to reality, but rather that what we go on to do with those representations can alter the kinds that exist in the world and the natures of those kinds. We should be careful not to be too carried away by this conclusion. After all, at least in the social domain, human thought and action are often what lead to a change in the phenomena that we study and classify. For example, if it were not for human actions, such as the actions of buying and selling commodities in a market economy, nothing could be classified as *capital*. The main difference in the case of interactive kinds would seem to be that the thoughts and actions that lead to a change in the phenomena in question are *classificatory* thoughts and actions. The changes are a result not of generic human action, but the act of classifying in particular. (This point will be revisited in Section 6.)

The main philosophical implication that might be drawn from the phenomenon of interactive kinds is that at least some kinds come into being by being conceptualized, labeled, and as a result of actions based on those concepts and labels. Hacking suggests at times that this is what happened with the kind *multiple personality*. He writes: 'The category and the people in it emerged hand in hand' (Hacking [1986], p. 165). And he relates the view of some skeptical psychiatrists concerning the multiple personality 'epidemic': 'The epidemic that surged in the late 1970s was, they said, largely composed of unhappy people who cultivated symptoms that made them feel important, and was fostered by uncritical medicine' (Hacking [1995a], p. 41). He also gives us various clues as to how this process might occur at the micro-level. For example, in attempting to explain why patients diagnosed with multiple personality

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[4] This is a non-standard understanding of nominalism, which is usually regarded as a metaphysical thesis that denies the existence of abstract universals. Here, I will simply follow Hacking's usage, according to which nominalism is the thesis that 'the world does not come with a unique prepackaged structure'.

are predominantly women, he cites the conjecture of one researcher that male multiples end up in the criminal justice system rather than the mental health system. Hacking ([1995a], p. 70) writes:

> Perhaps these gigantic 'systems' of health and justice play an important part in channeling and organizing symptoms and their display. Not only do people of different sex get caught by different systems, but also the functionaries and people with little pieces of authority within these systems work on those whom they catch in order to train them to fit in with expectations. And of course once you are caught by justice or mental health, the easiest thing to do is to behave as you are supposed to—violently or weakly, as the case may be. It becomes second nature.

This is just one way in which he suggests that the phenomenon of multiple personality has been largely manufactured or produced by those in positions of authority who conceived of the kind and treated people on its basis. By complying and reacting in certain ways to our classifications and accompanying actions, those people diagnosed as multiples may have helped to bring the kind into being. This process has also led to new properties being associated with the new kind, which have led us to acquire new beliefs associated with it. For example, with time it transpired that most multiples were women not men, and the number of alter personalities has gradually increased over the years. Although this process is compatible with multiple personality's being a real condition, in the sense that it consists of real symptoms that produce suffering among patients and is not merely a figment of the patient's or diagnosing clinician's imagination, it suggests that different kinds might have emerged had different kind-concepts been introduced. If people have been nudged into adopting some of these symptoms in order to conform to a certain psychological classification scheme, then another kind-concept associated with different properties might have been introduced in its stead and have led to different symptoms being produced. This constitutes at least a prima facie challenge to a realist picture, according to which our classificatory practices do not themselves create the kinds into which we classify things or alter them substantially, but merely observe and record the existence of those kinds.

In addition to what might be called 'self-fulfilling' interactive kinds, there are also cases of 'self-defeating' interactive kinds. Sometimes, the act of classifying people into a kind causes them to behave in such a way as to conform to the kind, but at other times, people reject the classification or end up behaving in such a way that our classification and our associated beliefs need to be altered in certain respects. In such cases, we may have to revise our concept or replace some of the beliefs associated with it because the kind and the phenomena belonging to it have changed to such an extent that we are required to modify our classification scheme. Here too, the introduction of the kind-concept along with

the corresponding label causes certain significant changes in reality, which in turn lead us to change or revise our concepts and theoretical beliefs. Were it not for human classificatory thoughts and actions, the kinds that exist in the world would have been different.

It may be thought that their interactive character is precisely what makes many human kinds non-real, and indeed that this is partly what underpins the distinction between real and non-real kinds. The fact that the realist picture does not apply to such kinds may be taken to be no threat to realism, but rather an indication that many if not most human kinds are not real. However, I will argue in due course that many paradigmatic real kinds can also be shown to be interactive and do not conform to the realist conception of kinds. Moreover, it may be difficult to draw a clear distinction between those kinds that are and those that are not interactive. Hence, it may be difficult to segregate kinds neatly into those that conform to the realist picture and those that do not.

There is another philosophical consequence of the phenomenon of interactive kinds, which is epistemological rather than ontological. If the changes that take place in the individuals and phenomena classified are significant enough to change the extensions of our kind-concepts and the beliefs associated with them, in what sense are we still dealing with the same kinds? Substantive changes in the properties of those classified will affect the identity of the kind, and these will be reflected in modifications in our beliefs, which may affect our concept of that kind.[5] This is why Hacking claims that interactive kinds are a 'moving target' and thus constitute an obstacle to systematic inquiry. As he puts it ([1999], p. 108): 'The targets of the natural sciences are stationary. Because of looping effects, the targets of the social sciences are on the move.' He also explains why this poses an epistemological problem as follows ([1995a], p. 61): 'The concept of child abuse may itself be so made and molded by attempts at knowledge and intervention, and social reaction to these studies, that there is no stable object, child abuse, to have knowledge about.'[6] After successive iterations of the looping effect, it seems that we may no longer be dealing with the same thing we started with. That may make it difficult to study such a thing or conduct an inquiry about it.

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[5] There is no widely accepted account of conceptual change in science. Here, I am assuming what many accounts do, namely that at least *some* changes in extension and/or beliefs will affect the identity of the concept. If *no* such changes do, then presumably the problem of the "moving target" does not arise, and there is no need to try to address it.

[6] Hacking ([1986], p. 165) states: 'With concepts such as this [*child abuse*], it is not to be expected that they will stay fixed for long.' But he also says elsewhere that it is not a 'vain hope' to study child abuse simply because the object of knowledge is always changing; as long as we do not think of the knowledge 'as scientific and above all medical knowledge, as knowledge of chemistry and tissues and organs' (Hacking [1991], p. 288).

However, I will not be dealing with this aspect of interactive kinds in this paper, but will focus rather on their ontological status.[7]

4 Are All Interactive Kinds Human Kinds?

Having explicated the phenomenon of interactive kinds and having offered some conjectures as to its philosophical significance, I will try in this section to delineate the scope of the phenomenon and to determine what it is about such kinds that may lead to their having a status that other (indifferent) kinds lack. As mentioned above, Hacking holds that the looping effect occurs only for human or social kinds (though not perhaps for all such kinds), but some of his critics have charged that there is nothing to prevent it from occurring among non-human kinds. I will try to adjudicate the dispute in order to determine whether interactive kinds are confined exclusively to the human or social realm and what it is about interactive kinds that generates the 'nominalist' or anti-realist implications noted above. In other words, I will try to convey a better sense of both the scope and significance of the phenomenon.

Clearly, for many classificatory kinds, even the first arc of the loop is absent. Stars are oblivious of our categorizing them as *red dwarves*, and cloud formations are indifferent as to whether we classify them as *cumulonimbus*. Likewise, it does not generally have an effect on an elementary particle that we put it in the kind *lepton*, or to a bacterium that we label it a *bacillus*. But for some other non-human kinds, the first arc of the loop might seem to be in place. For instance, we might classify a certain tumor as a *carcinoma*, which leads to our acting in a certain way toward it, resulting in its elimination. But this may merely be a change that affects one member of the kind, not all or many members of that kind, or the properties that those members possess.[8] However, other examples seem to show that such changes to reality might affect not just particular members of a kind but also the properties possessed by all or many members of a kind. James Bogen ([1988], p. 66) responds to Hacking by using the example of classifying marijuana as *illegal*:

> Our thinking of these plants as crops (as dangerous drugs) produces changes in cultivation, distribution, etc. These changes affect the plants, and attention to those effects changes our ideas.

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[7] If interactive kinds change too rapidly for human inquiry, this may pose a practical obstacle to studying them systematically, but they may also be stable enough to be studied by both the natural and social sciences. As emphasized by Mallon ([2003]), in some cases the looping effect serves to stabilize the kinds rather than alter them.

[8] But note that in some cases, the effect may be more significant than that. For example, if some kinds of *carcinoma* turn out to be surgically operable we might come to classify them differently, thereby altering the extension of the kind in a significant way. I owe this point to an anonymous referee.

Similarly, Sally Haslanger ([1995], p. 104) observes that 'opinions about what is appropriate for humans to eat and so about what counts as "food" have had a huge causal impact on the size, distribution, and behavior of animal populations'.

However, Hacking might object that these cases are different from those he has in mind. Prior to the challenges by Bogen and Haslanger, he had already considered the case of tuberculosis bacilli that have been classified as *pathogens*. This classification leads us to develop a vaccine that is effective against them, which may lead to the total elimination of individuals of that kind. But Hacking ([1986], p. 166) objects that this is importantly different from the cases he has described:

> What happens to tuberculosis bacilli depends on whether or not we poison them with BCG vaccine, but it does not depend upon how we describe them. Of course we poison them with a certain vaccine in part because we describe them in certain ways, but it is the vaccine that kills, not our words.

What Hacking seems to be saying is that the effect on the phenomena in question must not merely be a result of what we go on to do based on our classifications (as in the case of the tumor or the marijuana plants or the animal populations), but must rather be a result of those classifications themselves. He might say that in the case of the tumor classified as *malignant*, the plant classified as *illegal*, and the animal classified as *food*, our concepts do not themselves effect a change in the phenomenon under investigation. In contrast, when it comes to *multiple personality*, the invention of the concept and its identification as a distinct 'disorder' with its own label is what leads to people being treated in certain ways and being driven to take on certain roles. However, this response does not seem adequate, for in Hacking's paradigm cases, it is not the very invention of the concept and label that generally has an effect, but their dissemination and their use in classification. Indeed, dissemination and classification is rarely if ever enough; the labels and the concepts associated with them must be deployed in certain ways, by somehow being transmitted to the human subjects involved (though they may not be directly aware of them), which involves their being treated in various kind-appropriate or -inappropriate ways, and so on.[9] Thus, in the cases that Hacking discusses, it is not the *mere* classification that has an effect, but rather what we go on to do with our classifications.

Perhaps the real difference is not to be found in the first arc of the loop, but in the second arc. It is not so much that our classifications have an effect on

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[9] Later, in Section 4, I will consider whether awareness of those classifications is a crucial feature of the process.

what is being classified, but that the effect is significant enough that it leads to a change in reality, which in turn alters the very concepts that we started with and the beliefs associated with them. This response on Hacking's behalf is unlikely to succeed, since cases can be conjured up in which non-human kinds also loop back on our classifications in a significant way. Haslanger's example may be a case in point. One might argue, though she does not, that in the case of animals classified as *food*, our human classificatory practices have led over generations to the selective breeding of certain organisms, giving rise to new species and subspecies. These species have, in turn, altered the extension of our concept of *food*, since some plant varieties not considered food have been genetically altered through selective breeding to be edible. It has also led to the emergence of new concepts, such as *livestock* and *poultry*. This shows that our classifications have been altered in response to the changes we have wrought on these animals, based in turn on our classifications.

The case of domesticating animals bears a closer look for the instructive parallels it affords with the cases that Hacking is concerned with.[10] It is plausible to suppose that humans first classified some animal species as being tamer than others, whether explicitly or implicitly, and chose tamer individuals from these relatively tame species to domesticate. Despite the fact that such classifications may not have been overt or scientifically grounded, they were more or less coherent and constituted the basis for interventions in reality. Over numerous generations, thanks to artificial selection, the descendants of these animals became tamer still, giving rise to new kinds of animal. Consider the earliest such process, which led to the domestication of dogs (*Canis familiaris*) and to their divergence from wolves (*Canis lupus*), some 15,000 years ago, according to most current estimates. There is some dispute among scientists as to how the process was initiated. On one theory, it began with individual wolves lingering near human settlements to scavenge food, while another theory speculates that humans may have singled out certain wolves on the basis of their relatively tame qualities.[11] In either case, steps were taken by humans to domesticate a number of these individual animals, and these initial steps were probably followed by a process of selective breeding, whereby humans selected ever more docile individuals to mate with others, whether consciously or not. Although this process took place primarily at the level of phylogeny, it also involves ontogeny, since individual dogs are also trained in the course of development, being rewarded for tame behavior

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[10] Despite the fact that this case has been mentioned by Hacking himself ([1992], p. 190), as well as by one of his critics (Cooper [2004], p. 78), it has not been developed at any length.

[11] Things were probably more complicated than my brief sketch might indicate, though it does not matter for our purposes. Morrell ([1997], p. 1647) notes: '[…] although humans tamed members of that lone progenitor species at least twice, domestication was apparently a relatively rare event, requiring special skill.' See (Vila et al. [1997], p. 1687) for further details.

(as well as for developing other skills, such as hunting or shepherding), therefore becoming increasingly domesticated as they mature. The morphological and behavioral changes that have resulted are in many cases very significant. Recent studies indicate that 'dogs have been selected for a set of social-cognitive abilities that enable them to communicate with humans in unique ways' (Hare et al. [2002], p. 1634). These same researchers find that, 'as a result of the process of domestication, some aspects of the social-cognitive abilities of dogs have converged, within the phylogenetic constraints of the species, with those of humans through a phylogenetic process of enculturation, perhaps similar in some ways to the ontogenetic process of enculturation experienced by some non-human primate individuals raised by humans' (Hare et al. [2002], p. 1636). This process certainly led to altering the nature of dogs, giving rise to the variety *C. familiaris* itself, as well as to creating new kinds or breeds of dog, thereby leading us to introduce new labels (e.g. *golden retriever* and *Pekinese*). This is a clear illustration of how the concept of a non-human kind (*tame* or *domestic animal*) can be used to initiate significant alterations in reality, which in turn generate feedback that leads us to revise our concepts or introduce new ones (*C. familiaris*, *golden retriever*, etc.). Moreover, the concept *domestic animal* is in some sense a self-fulfilling one: Humans first conceived of taming animals, identified some that were tamer than others, and proceeded to tame them further, producing animals that were tamer still, thereby reifying the concept and creating a new kind of animal.

A response could be made on Hacking's behalf to the effect that, while the classification of domestic animals pertains to the non-human realm in some sense, it only pertains to non-human animals insofar as they affect humans, so the kind *domestic animal* is a human or social kind after all. However, this seems like a desperate move, since the standard way of identifying human or social kinds is by reference to what is being classified rather than the purposes to which the classifications are put.[12] Accordingly, it would be wrong to claim that the classification of non-human animals is a human or social classification in the standard sense. Furthermore, the feedback loop that Hacking is interested in is only operative when humans are actively involved in applying classifications and observing their effects; that is how the phenomenon was characterized in the first place. Therefore, in some sense, we should expect all interactive kinds to have some significance to human goals and purposes, but that should not make them all human or social kinds. Otherwise, Hacking's claim that all interactive kinds are human kinds would be trivial.

Another response might be offered on Hacking's behalf. Indeed, the response is briefly suggested by Hacking himself when he considers the charge

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[12] Hacking ([1995b], p. 354) would seem to concur: 'When I speak of human kinds, I mean [...] kinds that primarily sort people, their actions, and behavior [...]'.

that non-human kinds display feedback effects no less manifest than those exhibited by human kinds. He comments (Hacking [1992], p. 190): 'Well, if there is one [a feedback effect], it works not at the level of individuals but through a great many generations [...]'. This suggests that the difference lies in the fact that the feedback that he identifies takes place in ontogeny, whereas these other examples of feedback occur in phylogeny. There are two points to be made here. The first is that when it comes to the domestication of dogs, it has already been observed that the changes take place both ontogenetically and phylogenetically, so it is incorrect to say that the concept *domestic animal* does not produce changes within the lifetime of individual dogs, causing them to mold their behavior to conform to our classifications and expectations. These behavioral changes may, in turn, be so significant as to lead us to modify our beliefs about the abilities of dogs and what they can be trained to do. The second, and more telling, point is that it is not clear why feedback that produces changes over phylogenetic history would not have the same philosophical implications as feedback that takes place in the course of an individual lifetime. After all, the changes to the individuals being studied appear more robust and just as capable of changing our beliefs about them. In the absence of some argument that shows otherwise, Hacking's response does not serve to rebut the claim that the looping effect applies to some non-human kinds, as it does to human kinds.[13]

5 Awareness and Intentional Action

Thus far, we have not attended to a feature of the phenomenon of interactive kinds that seems operative in many of the cases that Hacking discusses. Perhaps there is a significant difference between Hacking's interactive kinds and some of the examples that have been introduced to show that the phenomenon extends beyond the social realm, which has to do with the *type* of change that is wrought upon the objects that belong to the relevant kinds. Hacking often describes the looping effect as impinging on the psyche of the subjects being classified; that would seem to be ruled out in the case of non-human kinds.

In an early challenge to Hacking's idea that all interactive kinds are human kinds, Mary Douglas ([1986], p. 101) argued that microbes may respond to our attempts to eradicate them (based on our classifying them as harmful)

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[13] A question might arise here as to whether an extinct biological species, with which there was no human contact, should be considered interactive or indifferent. Since it could have been altered by human intervention, it might be considered interactive, but since it was not and now cannot be (since it is extinct), it might be considered indifferent. To avoid this quandary, it is preferable to consider as interactive all those kinds that can *potentially* be influenced by our thoughts and actions, whether or not they actually have been. However, in what follows, and in order to make the argument clearer, I will focus on actually rather than potentially interactive kinds. (I am grateful to an anonymous referee for raising this issue.)

by mutating, which leads us to modify our classification scheme: 'In the same way as sexual perverts, hysterics, or depressive maniacs [do], living creatures interacting with humans transform themselves to adapt themselves to the new system represented by the labels.'[14] Hacking's 'simple-minded reply' is that 'microbes do not do all these things because, either individually or collectively, they are aware of what we are doing to them' ([1999], p. 106).[15] Of course, one could simply define the looping effect in such a way that it necessarily involves awareness. That would make it easy to rule out these examples as genuine examples of interactive kinds. But the problem with this move is that it would make the claim that all interactive kinds are human kinds trivially true, since arguably only humans (and perhaps some animals) can be aware of what is being done to them. What Hacking needs to show is that there is some central feature of the looping effect of interactive kinds that requires awareness on the part of those classified. Accordingly, I will try in this section to determine whether awareness on the part of the subjects classified is necessary for generating the feedback loop and whether it is necessary for yielding the philosophical implications outlined in Section 3.

A look back at Hacking's various attempts to characterize interactive kinds reveals that psychological awareness is often implicated in some way. For instance, he tells us ([1988], p. 62): 'Abused children and abusive parents describe themselves differently and may behave differently (not necessarily better) when they come to see themselves as abused or abusive.'[16]

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[14] Douglas ([1986], p. 101) also writes: 'The real difference may be that life outside of human society transforms itself away from the labels in self-defense, while that within human society transforms itself towards them in hope of relief or expecting advantage.' But the example of domestic animals shows that this is not always the case.

[15] Compare Hacking ([1999], p. 107): 'In denying that *horse* is an interactive kind, I am not denying that people and horses interact. I am saying that horses are no different for being classified as horses. Indeed it will make a difference, in law and to a Shetland pony, whether ponies are classified as horses: but not because the ponies know the law.'

[16] In another formulation, Hacking ([1986], p. 165) writes: 'Making up people changes the space of possibilities for personhood.' He also writes, with regard to child abuse ([1991], p. 287): 'As types of behavior become characterized as normal or deviant, norms become established, norms to which people are glad to conform. Which means that people come to see themselves differently, choose different courses of action, and what is usual in human behavior itself changes, creating new phenomena to feed into an ever-changing concept such as child abuse.' Likewise, he states, with reference to multiple personality ([1995a], p. 68): 'Each of us becomes a new person as we redescribe the past […] I shall constantly return to the question of how that constructed knowledge loops in upon people's moral lives, changes their sense of self-worth, reorganizes and reevaluates their soul.' More generally, Hacking ([1999], p. 104) characterizes interactive kinds as follows: 'We are especially concerned with classifications that, when known by people or by those around them, and put to work in institutions, change the ways in which individuals experience themselves—and may even lead people to evolve their feelings and behavior in part because they are so classified.' Finally, in a more recent discussion of this topic he says that he is interested in the way in which 'various concepts, practices, and corresponding institutions, which we can treat as objects of knowledge, at the same time disclose new possibilities for human choice and action […]' ([2002], p. 4).

Therefore, it might be claimed that a central feature of the phenomenon of interactive kinds is left out by examples such as the domestication of *C. familiaris*, namely the element of awareness and intentional action. There is no denying that awareness is a feature of many of the examples that Hacking discusses. Moreover, it is possible simply to stipulate a link between interactive kinds and awareness. The interesting question is whether awareness is necessary for ensuring interactivity between the classification and the kind itself and for generating the looping effect.

To tackle this question, it is worth getting clear on what kind of awareness is at issue here. Is it awareness by the individuals classified of the kind-concept that is used to classify them? That is apparently not a feature of all the cases that Hacking discusses.[17] In the case of multiple personality, in particular, he makes it clear that in many instances the patients do not have to be explicitly aware of the diagnosis or the knowledge associated with it in order to generate the feedback loop. Consider Hacking's ([1995a], p. 236) description of the way in which some patients diagnosed as multiples adopt alternative personalities[18]:

> The new descriptive vocabulary of alters, such as switching, provided new options for being and acting. Instead of mood swings there was something much more specific that a person could be doing, namely, switching to a persecutor alter; a persecutor alter could be taking executive control.

Still, it might be said, even though individuals need not be aware of the concept *multiple personality* and the beliefs associated with it in order to set this process in motion, individuals in such a situation must show some degree of awareness in order to act in accordance with the expectations of their classifiers. But if by 'awareness' here we mean grasp of a certain set of beliefs about multiple personality, it is not clear that that is strictly necessary. At best, there is some awareness of 'what we are doing to them' (as Hacking puts it in his response to Douglas cited above), or of an attempt to treat them in a certain way, or of the acceptability of expressing certain things and not others. But perhaps in that attenuated sense, dogs are also aware of the attempt to

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[17] See, for example, what Hacking ([1999], p. 32) says about the kind *woman refugee*: 'A woman refugee may learn that she is a certain kind of person and act accordingly. Quarks do not learn that they are a certain kind of entity and act accordingly. But I do not want to overemphasize the awareness of an individual. Women refugees who do not speak English may still, as part of a group, acquire the characteristics of women refugees precisely because they are so classified.'

[18] Compare also Hacking's ([1995a], p. 79) description of the way in which some patients diagnosed as multiples adopt alternative personalities of the opposite sex because they are socially constrained to be heterosexual and are uncomfortable exhibiting homosexual tendencies: 'Initially multiples in therapy are ill; they do not choose roles selfconsciously. But suppose they acquire sufficient maturity to see that they have options open to them, and aim not so much at integration as at finding the kind of person they want to be. Then a formerly pathological gender could become the chosen way to be a person.'

domesticate them and might comply (e.g. in exchange for rewards) or not, as the case may be. In response to this point, Hacking may simply modify his claim somewhat so that interactive kinds include kinds of beings that are aware of what is being done to them, not just human kinds. However, as already suggested above, the real question is: What role is awareness playing in his argument? Is even a minimal level of awareness necessary to give rise to interactivity and to generate the requisite feedback loop? Consider the case of dogs: Insofar as *individual* dogs are aware of what we are doing to them, they may be capable of modifying their behavior directly in response to a training regimen aimed at their domestication. However, as a *collective*, their behavioral and morphological characteristics can be altered in accordance with artificial selection over the course of generations without any awareness of the process. Where there is awareness, the looping effect tends to take place within the lifetime of an individual rather than over generations. Most of the changes that are wrought upon domestic animals in response to our classifications and the modifications that ensue, which may lead us to adjust our initial classifications, do not take place in 'real time'. We may need to wait numerous generations before such effects take hold. In contrast, when it comes to human beings, such changes are capable of occurring within an individual lifetime, indeed over much shorter time spans, precisely because individuals may be aware of what is being done to them and can respond appropriately in short order.[19] However, I have already argued in the previous section that Hacking has not shown that this distinction between ontogenetic and phylogenetic changes amounts to a philosophically significant difference when it comes to interactive kinds. The example of domesticating dogs shows that feedback can be generated both phylogenetically and ontogenetically, with both processes combining to reinforce the feedback loop. In fact, when it comes to dogs, the phylogenetic looping effects seem more significant than the ontogenetic ones. Indeed, if the key is to affect all or most members of a kind, then it would seem as though phylogenetic changes are more important than ontogenetic changes.

A second line of defense for preserving the link between looping effects and awareness might be to claim that while those who are classified may not have to be aware of the kind in question, nor of the kind-concept with its associated beliefs, nor indeed of what is being done to them, still there must be *others* in society who are aware of the classification in order to generate the feedback loop in the first place.[20] But that should go without saying, since it is evident

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[19] Ontogenetic changes do not necessarily take place over a shorter time span than phylogenetic ones; for some species of organism, many generations can be contained within the lifetime of a single organism of another species.

[20] This is suggested by Hacking ([1995b], p. 374). After noting that human infants cannot provide 'self-conscious feedback', he writes: 'However, there can be looping that involves a larger human unit, for example, the family.'

from the way in which we have described the looping effect that someone has to deploy the label and make the appropriate classifications in the first place. In all cases, those who are aware of the classification will include, at the very least, the people responsible for devising the concept, attaching a label to it, and deploying it (often experts or authority figures). This seems no different in the case of multiple personality than of domestic animals. It might be a stretch to speak in terms of full-fledged human awareness in the case of the initial domestication of dogs, a process which began to take place before there were recognized experts and established social institutions. Still, for selective breeding to occur, someone must have been aware of the contrast between tame and wild animals and acted accordingly. The same process occurs when domestication takes place in the present day. Scientists choose specimens of plants and animals and practice artificial selection on them, leading to the creation of new varieties with new properties that then lead them to modify their classifications.

Hacking often makes a connection between the looping effect and intentional action. But even though he frequently characterizes the looping effect in terms of intentional action, that would (again) not seem to be necessary for the interaction and feedback to occur as described in Sections 2 and 3. I am not denying that in many cases, an intention to conform to or resist the classification is a central feature of the phenomenon and is also efficacious in generating the feedback. Perhaps the most salient example of this kind of feedback occurs with the kinds *homosexual* and *gay*, as Hacking ([1995a], p. 38) points out: 'The known about come to behave in the ways that the knowers expect them to. But not always. Sometimes the known take matters into their own hands. The famous example is gay liberation.' In this case, there is clearly a great deal of intentional action on the part of certain individuals, and this helps to generate the feedback effect in at least two different ways. Once *homosexuality* is introduced as a concept and certain beliefs come to be associated with it (e.g. that it is not a disease or disorder), then two types of change might take place among some individuals in society. Some people may be encouraged to 'come out of the closet' and become more open about their sexual preferences. Others might come to rethink their own identity and begin to self-identify as homosexuals, even though they might not have thought of themselves in this way before becoming acquainted with the new kind-concept and the beliefs associated with it. Despite the important differences among these two phenomena, both groups of individuals act intentionally to conform to the new understanding associated with this concept, though they may not have self-identified as such before (then they go on to transform it). Additionally, in both cases, the intentional actions may well be intentional under a description that makes reference to the kind *homosexual*. But although intentional action is a prominent feature of this particular case and perhaps of others like it, it is not necessary to ensure interactivity and to

generate the looping effect, as some of Hacking's other examples clearly demonstrate.

What is true is that in the case of some interactive kinds, particularly those in which the subjects classified exhibit self-awareness and awareness of the kind-concept that is used to classify them, it would be highly unlikely that they would engage in certain behaviors or adopt a certain lifestyle in the absence of this classification and the beliefs associated with it. This would seem to be the case for the kind *abused child*. Earlier generations might not understand why someone who was psychologically neglected as a child might be classified with someone who was raped by her father and with someone who was battered as an infant or why, in awareness of this classification, these people would then form a support group and come to think of themselves as having to overcome similar kinds of adversity. Such a grouping and the behaviors to which it leads may not have made sense or been available to an earlier generation. But this does not seem to be a feature of all the examples that Hacking discusses, nor does it seem to be required for interactivity and the looping effect.[21]

In this section, I have tried to show that neither awareness nor intentional action is required for interactive kinds to emerge and to generate the kind of feedback loops identified by Hacking. These features are not found in all of Hacking's examples, nor do they seem necessary to lead to interaction between kind-concepts and what they classify. In some cases, awareness, or at least some kind of direct responsiveness, may lead to 'real-time' feedback loops in the lifetime of the individual rather than the species. But the interactivity and feedback that occur in ontogeny are no more significant than those occurring in phylogeny, in terms of their philosophical consequences. These arguments further strengthen the claim that interactive kinds are not exclusively drawn from the human or social realm. In the following section, I will raise and attempt to address a question concerning the ontological status of interactive kinds and their significance for realism about kinds.

6 Ontology

Classificatory practices and the actions based upon them can sometimes have an effect on what is being classified. This effect and the ensuing response can be so substantive that they result in changing the nature of what has been classified, forcing us to revise our original classificatory concepts and the beliefs associated with them. I have argued that the phenomenon that Hacking has

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[21] Hacking sometimes uses Anscombe's account of intentional action to argue that it is not 'logically possible' to engage in such behaviors before the corresponding category has been devised. In my opinion, Cooper ([2004]) argues convincingly that Anscombe's theory cannot be used to argue for this claim. I agree with Cooper that the category plays a *causal* rather than a *logical* role in enabling such action.

identified is not restricted to human or social kinds, but can also occur for non-human kinds of the type studied in the natural sciences. But it does not seem to be applicable to all kinds, and many of the kinds in the natural sciences appear not to participate in such looping effects. Human beings have either brought these kinds into being or modified them significantly by conceiving of them and acting on their conceptions, thereby altering the properties that co-occur in reality. This would seem to challenge the realist view that the kinds found in the world exist and are the way they are independently of our conceptions of them.

I noted in Section 3 that Hacking thinks that the main philosophical implication of the looping effect is that it sanctions a form of 'nominalism' about interactive kinds, the thesis that 'the world does not come with a unique pre-packaged structure'. On a weak reading of this metaphor, 'pre-packaged' means something like fixed or unalterable. If so, the fact that the world is not pre-packaged follows simply from the fact that the kinds that exist in the world are influenced in part by our classifications and associated actions. However, if the metaphor is read as implying that interactive kinds are subjective in the sense that they are present merely in our minds and discourse, then that does not follow from anything that has been said about interactive kinds.[22] There is a difference between saying that a certain kind of individual is present only in the mind of the beholder and saying that that kind of individual would not have existed without our classifications and has been brought about partly in response to them. The latter claim is clearly compatible with saying that the kind has an existence that is independent of our subjective apprehension.[23]

Interactive kinds are not subjective, though they are mind-dependent in the sense that they would not have existed without the thoughts and actions of human observers. If the argument of the previous sections is correct, some kinds that are considered paradigmatically real, such as biological species, can also be interactive and therefore mind-dependent. Indeed, not only biological species but even chemical compounds and chemical elements may exhibit features associated with interactive kinds. Consider a chemical engineer or materials scientist who conceives of a substance with certain macro-properties then goes on to synthesize a chemical compound with a molecular structure that has never

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[22] This stronger claim is also suggested by Hacking's saying that kinds are 'not determined by the nature of things' ([1999], pp. 6–7). I am grateful to an anonymous referee for pointing out the ambiguity in the 'pre-packaged' metaphor.

[23] Compare Hacking ([1995b], p. 358): 'I do believe that some psychiatrists, the media, a wing of the women's movement, concern about sexual abuse of children, and much else have brought about the present prevalence of multiple personality disorder. That does not make the malady any less real.' However, he also writes of autistic children ([1995b], p. 379): 'Is there not a real kind (or kinds) of children out there that in the end we will know something about? That is by no means clear to me.'

occurred in nature and that has precisely those macro-properties. This new chemical kind can be considered interactive because it came into existence as a result of human conception and related action. True enough, a kind of chemical compound may not loop around by responding to our modifications, but the first arc of the loop is surely in place, since that kind of compound would not have been instantiated in the world were it not for the fact that a scientist conceived of it and acted on that conception. The main difference between this case and some of those we have been considering is that there does not seem to be quite as much control over this chemical kind. That is because in this domain, the nature of the phenomena themselves imposes greater restrictions on the kinds that we can create. This point becomes clearer if we reflect not on chemical *compounds* but on chemical *elements*. Here too, after much theoretical research, we can decide to bring into existence a wholly new kind like *roentgenium* (atomic number 111, atomic weight 272) by fusing bismuth-209 and nickel-64 in a linear accelerator, but we cannot bring into being a new kind of element with, say, 120 protons and 10 neutrons. Even if our technology were up to it, such a nucleus would not be stable. When it comes to chemical elements, we are severely constrained as to what kinds we can bring into being because these phenomena do not have the requisite flexibility or degrees of freedom. With chemical compounds, we are less constrained but we are unable to fashion them freely to conform to our conceptions (for one thing, we have no control over which elements may bond with which others, in what proportions, and so on). In the other cases we have been considering, whether human or non-human kinds, the constraints are less stringent, though not completely absent. But the differences between these kinds (chemical compounds and elements on the one hand and psychological disorders and domestic animals on the other) seem to be a matter of degree. In other words, interaction between concept and kind can be found in other domains though it may be more constrained. Nevertheless, like other interactive kinds, these kinds are also dependent on human conception and action.

Here, an objector might concede that some biological species, chemical compounds, and even chemical elements can be interactive kinds, but insist that there is nevertheless an important difference between them and interactive *human* kinds. I stated in Section 1 that a minimal realist stance toward kinds would regard them as mind-independent. The claim of mind-independence is admittedly rather vague, but it would seem to be a necessary component of a range of realist views about kinds. If so, there is likely to be a strong suspicion among realists that even though some of these non-human kinds can share some of the properties of interactive kinds, they cannot be said to be mind-dependent and therefore non-real, in the same way as interactive human kinds. Is there any way of showing that, though they are interactive, the chemical and biological kinds that we have described are importantly different from the others? In what fol-

lows I will consider four ways of distinguishing among interactive kinds and will argue that none of them is capable of differentiating those that are considered paradigmatically real from those that are not.

First, as stated above, some domains place greater constraints on the kinds that we can invent or give rise to. In some domains, it seems as though we can fashion such kinds to suit our goals and interests, while in others there are severe limits as to which kinds we can create. But there does not seem to be a principled way of drawing a line between 'unconstrained' and 'constrained' interactive kinds. Moreover, it is not clear that the constraints are always greater for non-human kinds than for human ones, since humans are not as pliable as some other natural systems. Hence, while it is true that we have more freedom in creating and shaping some interactive kinds than others, that does not enable us to distinguish among two classes of interactive kinds, one of which can thereby be considered more real than the other.

A second dimension of variation among interactive kinds has to do with the extent to which the kind has been intentionally created and whether the thoughts and actions that led to its emergence were deliberately aimed at giving rise to that kind itself. It does appear as though when it comes to the creation of some interactive kinds, we have created them in a premeditated fashion, whereas for other interactive kinds the act of invention is somewhat less deliberate. But this difference cannot be used to segregate human interactive kinds from non-human ones, since the former are sometimes less deliberately created than the latter. The creation processes for some kinds of artificially selected or genetically engineered biological species, for example *triticale* grain, exhibit far more conscious intention and planning than those leading to the emergence of some of the human kinds that we have discussed, for example *child abuse*.[24]

A third type of variation among interactive kinds concerns the extent to which the kind responds to human intervention after it has been first created or modified. On this dimension, chemical compounds and elements would seem to be rather weakly interactive, whereas biological species and human kinds are more strongly interactive. In the former cases, the kinds do not seem to be capable of evolving in response to human intervention. Though we may

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[24] All human kinds come about as a result of human thought action, but not all of them are intentionally created on the basis of human thought and action (for example, though *inflation* could not exist without human intention, presumably humans did not intend this kind to come into existence). A similar point has been emphasized by Amie Thomasson ([2003a], [2003b]), who criticizes John Searle ([1995]) for failing to recognize that many social or institutional kinds do not depend for their existence on people's having thoughts about those kinds themselves. As she points out, this may hold true of the kind *money*, but not of the kind *recession*. Thomasson ([2003a], p. 276; original emphasis) writes that 'a given economic state can be a recession, even if no one thinks it is, and even if no one regards *anything* as a recession or any conditions as sufficient for counting as a recession'. Interactive social kinds complicate the picture, since they are mostly intentionally created but not in a conventional manner like the social kinds that Searle is interested in.

bring into being a new kind of element or compound, those new kinds will not transform themselves further in response to our actions toward them. This provides a contrast with the human kinds that Hacking discusses, as well as with the biological kinds that I discussed in previous sections. Unlike those cases, it seems as though many kinds in the natural sciences can, at best, come into being as a result of our conceptions and actions, but will not react to them in a way that will lead to a change in our beliefs about them. However, note that the mind-dependent quality of interactive kinds concerns not just their propensity to respond to our classifications but rather also our ability to influence them in the first place. Thus, although there does seem to be a difference on this count between the chemical kinds (on the one hand) and the human and biological kinds (on the other), it is not a difference that can be used to show that the former are somehow less mind-dependent than the latter.

Finally, it might be said that there is a fundamental difference between two types of mind-dependent kinds, namely those that happen to exist as result of our thoughts and actions and those that necessarily exist as a result of our thoughts and actions. Only the latter are mind-dependent in a strong sense, since they *could* not have existed without human minds. Even if we grant that atoms of roentgenium and molecules of polystyrene have only ever existed in the history of the universe as a result of human manipulation, surely they might have existed without our intervention had the right particles combined in just the right way to bring them into being. The same is true for dogs, which might have evolved from wolves by natural selection rather than artificial selection. Though highly improbable, such a sequence of events is not impossible. Clearly, the same could not be said for child abusers; their existence is dependent on the existence of human beings. However, if real kinds were restricted to those that could not have come into existence without the presence of human minds, the only real kinds would be non-human kinds. That is because all and only human kinds, whether interactive or not, could not have come into existence without human minds; and only non-human kinds could have come into existence without human minds. (It may be that some non-human kinds also could not have come into existence without human action, but it is not immediately obvious which ones these are and indeed how to tell which could have and which could not have.) Therefore, if the realist criterion were to be framed in terms of what could *possibly* have existed without human minds (as opposed to what *actually* would not have existed without humans), it would be trivialized, since all human kinds would be non-real, and only non-human kinds could be real—though which ones these are is not apparent.

This leads me to the conclusion that there are interactive kinds in the non-human domain just as there are in the human domain, and the latter are not necessarily more mind-dependent than the former. There does not seem to be

a way of making a distinction among interactive kinds so as to rule some to be more real than others. All are mind-dependent in some way and to a certain degree. If that is right, then this complicates any attempt to draw a distinction between real and non-real kinds, since the mind-dependence of some chemical compounds and biological species would lead us to conclude that they are not real, though other compounds and species are considered paradigmatically real kinds. If one were to dismiss all interactive kinds as non-real, it would turn out that *boron*, *hydrochloric acid*, and *C. lupus* are real, while *roentgenium*, *polystyrene*, and *C. familiaris* are not. Here, it might be objected that the criterion of mind-independence should not be used to pick out the real kinds. But this objection merely reinforces my conclusion: Mind-dependence is not a criterion that we can turn into a useful basis for distinguishing real from non-real kinds. If one is to uphold the realist distinction, then another criterion must be sought. One possibility is to refine the notion of mind-dependency in such a way as to distinguish between kinds that are *causally dependent* on human intentions and actions and those that are *constituted* by them.[25] It might be said that real kinds may be causally dependent on human minds, but not constituted by them. For this to work, the operative notion of constitution would need to be spelled out in some detail and distinguished clearly from causal dependence.

Interactive kinds, whether human or non-human, would not have existed or have been the way they are without human thought and action. They are therefore imbued with a kind of mind-dependence, but not in the sense that they exist solely in the mind of human observers, but rather in the sense that we have some power to give rise to these kinds and some control over their subsequent evolution. This constitutes a challenge to the realist picture that I sketched out at the beginning of the article, according to which real kinds of individuals and phenomena come into existence independently of our thoughts about them and are not significantly transformed by our actions. But it does not undermine this realist account entirely, for even though interactive kinds would not have existed without our classificatory practices, that does not mean that they are merely subjective or are not really there. Nor are they mind-dependent in the sense that thinking that something is the case thereby makes it the case. Rather, thinking that certain kinds of things exist with such-and-such properties *and acting in certain ways* may in some cases end up producing things of those kinds or modifying things of those kinds in significant ways. Still, the thesis of realism, as specified in Section 1, needs some modification if it is to serve as a basis for picking out real kinds.

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[25] This distinction was pointed out by an anonymous referee. Similarly, Richard Boyd ([1991], pp. 144–5) thinks that the way to save realism about mind-dependent social kinds is to make a distinction between kinds upon which the mind has 'profound causal effects' and those to which the mind makes logical or conceptual contributions. But he does not elaborate further on this distinction, since his stated purpose is not 'to defend the metaphysical innocence of social practices'.

7 Conclusion

In this paper, I have undertaken an examination of the phenomenon of interactive kinds, which was first investigated by Hacking. By considering a number of examples, I have argued that interactive kinds are not only human or social kinds. If what is distinctive about such kinds and what gives them philosophical significance is the fact that they are influenced by our classifications and that they are able to loop back and influence those classifications, then the phenomenon is not confined to the human or social realm but can also obtain outside of that realm. I have also considered in what sense the existence of interactive kinds challenges realism about kinds. Interactive kinds force us to reflect on what it means for a kind to be mind-dependent. They are subjective only in the weak sense that they can be created and altered as a result of human beliefs and actions, not in the strong sense that they are relative to the human mind. Still, they challenge a realist account of kinds that takes them to be mind-independent, for these kinds would not have existed or have been the way that they are without human thoughts and actions. Since I have argued that it would be implausible to regard all interactive kinds as non-real and since there does not seem to be an interesting way of distinguishing among them, we seem to have two options. The first would be to develop a modified criterion for what makes a kind real. Failing that, we should abandon any attempt to distinguish real from non-real kinds on metaphysical grounds. Instead, we should adopt a weak realist view that considers as real any kind that plays an indispensable role in explaining phenomena, making successful predictions, and otherwise featuring in successful inductive inference.[26]

Acknowledgements

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[26] This may or may not be Hacking's view too. As he writes recently ([2006], p. 6): 'Some classifications are more natural than others, but there is no clear and distinct class of natural kinds, and there is no useful vague class either.'

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