# CONSIDERING POST-ESSENTIALIST KINDS: AMBIGUITIES OF EPISTEMIC ACCESS AND THE SLIPPERY SLOPE OF THE REAL

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# Abstract

I examine two accounts of natural kinds which attempt to maintain natural kind realism while justifying the failures of traditional natural kind essentialism. I understand the *accommodationist* proposal to hold that natural kinds are real because of underlying causal mechanisms that support successful inferences. The *promiscuous realist* proposal yields two possible ways of developing natural kind realism; I call them *reference realism* and *conceptual inevitability*. All three routes to realism are shown to be inconsistent. I suggest that the solution is not to adopt a strictly anti-realist attitude, but rather to accept the ambiguities of epistemic access and avoid further attempts to traverse the slippery slope of the real.

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# Table of Contents

Abstractii
Acknowledgmentsiii
Table of Contents iv
Introduction
A. Properties and Natural Kinds
B. Post-essentialism
C. Direction of the Thesis
Chapter 1 – Essences and Kind Realism
B. Ordinary Language and the Cosmic Machine9
Chapter 2 – Two Ways to be an Inclusive Realist
A. Accommodationism
B. Promiscuous Realism15
C. Inclusive Realism
Chapter 3 – Accommodationism, Real Essences, and Empirical Adequacy21
A. Approximate Truth, Real Essences, and Epistemic Access
B. Empirical Adequacy23
C. Non-causal Contributions
Chapter 4 – Properties and Pluralism
A. Two Realisms, Two Pluralisms
B. Dupré and the Three Worlds
C. Goodman's Worlds
D. Summary
Conclusion

# Introduction

Kinds are groupings of particular objects that bear some similarity to one another and are referred to by using kind terms. The kind term "rubber ball," for example, refers to all of the particular objects in the world that are part of the kind referred to by the term "rubber ball." Kind essentialism, as I will refer to it, is the view that kinds have an essence consisting of necessary and sufficient conditions for membership. All of the objects that make up the extension of a kind term are supposed to be similar in some respect, that is to say that they have at least one property that is *the same*.<sup>1</sup>

# A. Properties and Natural Kinds

# 1. Properties

Kinds are defined by properties. Any property might define a kind, but not all properties are regarded equally; for example, the property "was touched by Einstein" is generally understood as *trivial*. The kind defined by such a property would include pens, notebooks, various eating utensils, door handles, faucets, currency, and an enormous number of other objects that Einstein touched. The property can be trivial in two ways: trivial<sub>1</sub> properties are regarded as having no significance beyond the interests and purposes of humans (such as the collectors of such items); on the other hand, if there never were such humans, then trivial<sub>2</sub> properties are those which are unnecessary to account for the unfolding of events in the universe.

The opposite notion of a trivial<sub>2</sub> property is a *real property*: even if there were no humans, *real properties* are explanatory of the manner in which events in the universe progress. The opposite of a trivial<sub>1</sub> property is a *privileged property*, which is a property *regarded* as having significance beyond the interests and purposes of humans. In other words, a *privileged* property is a property that is *taken* to be a real property. I intend to emphasize that *real* properties have no relationship to human enterprises, but *privileged* properties are those properties which, through human enterprises, are accepted as real properties. In order to clearly distinguish the two ways in which a property might be trivial, I refer to trivial<sub>1</sub> properties as *unprivileged properties* and use *trivial properties* to refer to only those which are, as a matter of fact, not *real* properties.

<sup>&</sup>lt;sup>1</sup> Quine (1970) notably emphasizes this point.

# 2. Natural Kinds

The kind terms produced by scientific theorizing must indicate groupings of particular objects that share a cluster of properties. Traditionally, natural kind terms are understood as kind terms the members of which share a cluster of real properties; further, it is commonly taken to be the case that natural kind terms are produced by scientific theorizing.<sup>2</sup> The cluster of real properties shared by the members of a natural kind is fully explanatory and predictive of the behavior of the particular objects that are members of that kind. Natural kind terms track the hidden similarities which are the basis of observable regularities, so any two members of the extension of a natural kind term should be interchangeable without producing an observable difference. For this reason, the members of a natural kind are often compared to the parts of a *cosmic machine*.<sup>3</sup>

Horses, hydrogen, hemoglobin, and quarks all stand as candidates for being natural kinds. For example, under natural kind essentialism, if some object meets the necessary and sufficient conditions for membership in the natural kind "hydrogen" then, based on that categorization, it can be predicted to have the other properties from the cluster of properties that are characteristic of that kind. It could be predicted to bond with oxygen and another hydrogen atom under particular circumstances, or it could be predicted to emit four wavelengths of visible light when excited by electricity.

I take it to be the case that natural kind essentialism is a stronger thesis than essentialism about conventional kinds because it holds, first, that there are clusters of real properties shared by the particular objects.<sup>4</sup> Second, that these shared properties result in two further tenets of natural kind essentialism:

(i) Natural kinds have essences consisting of necessary and sufficient conditions for kind membership.

(ii) Membership in a natural kind has explanatory and predictive force.

 $<sup>^2</sup>$  Some, like Mill (1882), would hold that the common real properties of natural kind members are "inexhaustible" (151).

<sup>&</sup>lt;sup>3</sup> Quine (1970), 52; Dupré (1993), 2-3. This metaphor is highly theoretical and seems to overlook the effort put into, and frequent failures of, making things the same enough that they can function interchangeably. See: Alder (1998).

<sup>&</sup>lt;sup>4</sup> Throughout this thesis I use the term "mind-independent" interchangeably with "real." Both are intended to convey a sense of existence that bears no relation to the contingent emergence of human-like subjects.

In other words, the first step of natural kind essentialism is natural kind realism—the position that there are clusters of real properties shared by particular objects—and the second step establishes the role of essentialism in successful inference, as justified by natural kind realism.

# B. Post-essentialism

#### 1. The Problem of Variation

Natural kind essentialism has been faced with challenges in biology and chemistry that stem from variations between the particulars that are members of their respective kinds. Under natural kind essentialism, every branch of science must provide necessary and sufficient conditions for the kinds which they investigate which are explanatory and predictive of the properties of the particular members of those kinds. So, for example, biology must provide necessary and sufficient conditions for an organism to qualify as a member of a species. This amounts to establishing an unchanging set of characteristics that all and only members of a species share. Not only does no such set of properties peculiar and common to members of a species present itself,<sup>5</sup> but such a rigid set of characteristics would inevitably be violated over the course of evolution.<sup>6</sup> This problem is indicative of an issue with tenet (i) because it calls into question the importance of actually meeting the necessary and sufficient conditions for being a member of a kind.

Relatedly, in chemistry, such necessary and sufficient conditions do not hold across all classifications; sometimes molecular composition is emphasized while variations in structure are ignored or vice-versa.<sup>7</sup> This casts doubt on the claim that natural kind terms are based on real properties. Furthermore, the macro-properties and dispositions exhibited by a chemical, such as its boiling-point, can vary to a considerable degree depending on largely contingent factors, including the material that the vessel in which it is boiled is made out of.<sup>8</sup> This indicates a problem with tenet (ii) because knowing what natural kind some substance is cannot explain or predict its behavior in every circumstance. The problem of variation is one motivation which

<sup>&</sup>lt;sup>5</sup> Dupré (1993), 28.

<sup>&</sup>lt;sup>6</sup> Mayr (1959), Sober (1980), Dupré (1993).

<sup>&</sup>lt;sup>7</sup> Leslie highlights the discrepancy in naming ethanol and dimethyl ether, two chemicals that share molecular composition but vary in structural organization, in comparison to the similar structural discrepancies in water that do not result in differentiation. (2013, 144)

<sup>&</sup>lt;sup>8</sup> Chang (2008), 235.

has resulted in a movement away from natural kind essentialism among philosophers of science, generating a number of post-essentialist proposals.

#### 2. Post-essentialism

Two prominent defenders of post-essentialist accounts are Boyd, who offers an alternative he calls accommodationism, and Dupré, who suggests a position he calls promiscuous realism. Accommodationism modifies tenet (i) of natural kind essentialism by replacing necessary and sufficient property conditions with homeostatic property clusters, which provide an indication as to what properties of which kind members must possess a sufficient number. This allows for the variation between species that is required for natural selection driven evolution to modify the properties of a species without violating the conditions of its kind membership. It also allows for variation in chemical properties like boiling points and structural or compositional features. Promiscuous realism, on the other hand, takes a more empirical approach by disavowing a priori commitment to the explanatory and predictive force of some particular object's membership under a natural kind, thus modifying tenet (ii). It emphasizes, instead, the role of social and historic purposes in shaping the distinctions drawn by the many branches of scientific investigation along with empirical evidence. Thus it places the extension of a kind term, along with any explanatory and predictive force regarding its extension as a kind might have, in direct relation to those purposes and empirical structures. Promiscuous realism is also compatible with Boyd's proposal to modify tenet (i), allowing for variation between kind members to the degree that it does not significantly interfere with the relevant purpose.

Both of the post-essentialist accounts are considered in further detail below. For now, what is important is that they are both realists with regard to natural kinds—they hold that natural kind distinctions track the real properties of particular objects. Each account has a different method of justifying their natural kind realist claims and will be considered at length below. They are designed to account for the failures of natural kind essentialism by modifying tenets (i) and (ii), resulting in what I refer to as *inclusivity* about natural kinds. It is inclusive because, in comparison to the traditional account of natural kinds, their modifications result in more kind terms qualifying as natural kinds. Because of these two features I will refer to such accounts collectively under the heading of *inclusive realism*. I will argue that modifications to (i) or (ii) nonetheless result in kind terms that are defined by privileged properties rather than real properties. Realism about such natural kinds is incoherent insofar as the properties that define them are *merely privileged*.

# C. Direction of the Thesis

This thesis takes the failures of natural kind essentialism in biology and chemistry as a starting point and examines the two aforementioned post-essentialist proposals.<sup>9</sup> In Chapter 1, I briefly summarize themes from Locke, covering important vocabulary for the arguments that follow. Then I proceed, in Chapter 2, to describe the two post-essentialist accounts under consideration in greater detail, focusing my analysis on their shared features of inclusivity and natural kind realism. I show how, in order to cope with the failures of natural kind essentialism, Boyd and Dupré expand the notion of natural kinds beyond the traditional sense indicated above. My argument is that the *inclusive* and *realist* components of their brands of post-essentialism are mutually exclusive.

In Chapter 3, I highlight the similarities of Boyd's account with Dupré's, and suggest that the primary difference between them is Boyd's stronger sense of natural kind realism. I then show how this commitment is motivated by the "No Miracles" argument for scientific realism. This argument holds that the only explanation of the inferential successes of scientific practice which does not require a miracle is that scientific theorizing approximates reality. I then recount Sober's Bayesian analysis of the argument which shows how this explanation is probabilistically indeterminable between approximating reality and producing empirically adequate but false theories. I also address Boyd's suggestion that a there is an innocuous diminished sense of *real* which can support natural kind realism under what he calls naturalized epistemology. This will show that Boyd's realism cannot justifiably stand on the inferential successes of science alone and requires a different (perhaps even an *a priori*) reason to favor the natural kind realist explanation. Due to the similarities his account shares with *promiscuous realism*. I suggest that Boyd could reasonably modify his realism to resemble that of Dupré.

In Chapter 4, I analyze Dupré's account, constructing two potential arguments for kind realism that appear to be compatible with his modification of tenet (ii). I refer to one as *conceptual inevitability*, which holds that certain concepts will inevitably arise given particular purposive and historically situated circumstances, thus giving rise to a realism that has certain elements of what Popper called *objective knowledge*. The other potential argument I refer to as *reference* 

<sup>&</sup>lt;sup>9</sup> For arguments against essentialism in biology, see Mayr (1959), Sober (1980), and Wilson et al. (2007); in chemistry see Leslie (2013), Chang (2008), Needham (2000); further, Khalidi (2011) provides a summary of arguments against microphysical reduction in general, which is relevant to the purposive nature of physics. It is possible to construe his points as opposed to essentialism in physics, but making that connection explicit falls beyond the scope of this thesis.

*realism*, which holds that the reality of kind terms is sufficiently established by the reality of the particular objects and properties that compose and determine their extension. I consider these two routes to realism in comparison to Goodman's proposal that all the best properties we can hope to use in kind definitions are privileged properties. I show how the same concerns that give rise to Dupré's pluralism is responsible for Goodman's rejection of real properties and conclude that both routes to realism are incompatible with pluralism.

# Chapter 1 – Essences and Kind Realism

In this chapter, I take Locke's discussion of general terms as my starting point and proceed through a brief summary of a few defining contributions made towards the modern conception of *natural kinds*. Along the way, I highlight the concepts that play important roles in later chapters. After establishing this background for the discussion, the next chapter outlines the central aspects of two post-essentialist accounts that share both a rejection of traditional kind essentialism and maintain natural kind realism.

# A. Locke's Kind Essentialism

# 1. General terms in Locke

Kind terms are general terms, since they are applicable to many particular things. Locke's discussion of general and particular terms opens with the observation that most words are general terms and offers three reasons as to why that might be the case. First, it would be beyond human capacity to name every particular thing. Second, it would be useless as a means of communication, each person being isolated to communicating with only those who are familiar with the same particular things *and* somehow make use of the same particular terms for them. Third, it would hinder the production of the general views which constitute the enlargement of knowledge.<sup>10</sup> Applicability to a number of particulars is characteristic of general terms and thus of kind terms as well. It is achieved by means of abstraction from the inherent embeddedness that differentiates particular things as such. For instance, a particular apple has a number of embedded properties which are both inherent to it being a real apple and taken to be irrelevant to it being a member of the kind "apple," such as its weight or spatiotemporal location. Locke's discussion of general terms is relevant because natural kinds are general terms produced by scientific theorizing.

#### 2. Real and Nominal Essences

The two components of kind essentialism, described above, correspond to Locke's distinction between real and nominal essences. Whatever reason there is for natural kind members behaving some particular way is caused by their real essence.<sup>11</sup> A real essence, then, consists of real properties. However, Locke emphasizes that the real essence of a natural kind is

<sup>&</sup>lt;sup>10</sup> Locke (1690), III, iii, 2-4: 394-5.

<sup>&</sup>lt;sup>11</sup> Ibid, III, v, 14: 423.

intrinsically unknowable.<sup>12</sup> Nominal essences, on the other hand, are the necessary and sufficient conditions that define a kind. These conditions consist of the abstract ideas language users employ to categorize experiences, and perhaps generate knowledge about the world. For Locke, nominal essences serve to mediate between human cognition and the mind-independent world by making it possible to refer to many particular things under the heading of a single general term consisting of abstract ideas. Post-essentialist accounts might differ over whether natural kinds have real essences, but I argue that natural kind realism requires natural kinds have real essences.

There are many complex and interesting questions about the relationship between linguistic terms and things in the world that I will leave aside, instead focusing on the act of creating general terms. Locke notes that the emphasis of certain properties is central to the possibility of general language. A general term is created when many particular objects share at least one property; the particular objects become a sort of thing. "Bachelor" relates my Uncle Phil to Prince Harry, Jake Gyllenhaal, etc. Does this list include Pope Francis? My cousin's newborn boy? The answers vary depending on what is taken to be definitive of the term's meaning. The nominal essence of the term "bachelor," for Locke, is nothing but the abstract idea which the speaker has in mind when using the term.<sup>13</sup> Locke repeatedly returns to a circle of inter-defining notions that proceeds: general term – abstract idea – list of particular examples – general term (beginning at any point and proceeding in either direction). While this "Lockean circle" was understood to be definitive of nominal essences, Locke emphasized that the real essence of a general term, like "bachelor," is unknowable (if there even is a real essence for such a kind). This does not change when the general term is a natural kind. Regarding the essences of natural kinds, Locke notes, "I have no distinct ideas at all; and, I am apt to suppose, others, when they examine their own knowledge, will find in themselves, in this one point, the same sort of ignorance."<sup>14</sup> This notion of ignorance as well as the Lockean circle will be revisited in the last two chapters.

<sup>&</sup>lt;sup>12</sup> Ibid, III, iii, 15 & 16: 402-3.

<sup>&</sup>lt;sup>13</sup> Ibid. III. iii. 9: 398.

<sup>&</sup>lt;sup>14</sup> Ibid, II, xxxi, 6: 363.

# 2. Abstract Ideas

Abstraction from the determinate characteristics of particular things is necessary to form the ideas that constitute nominal essences. Whether Locke took abstract ideas to be mind-dependent or mind-independent is a matter of controversy.<sup>15</sup> I will proceed with the provisional understanding that ideas, both abstract and concrete, are dependent on minds for their creation and realization. Locke took the nominal essence of a general term to be an abstract idea, and both to be identical with the being of some verbal or mental sort. Consistently, he held that every distinct abstract idea is a distinct nominal essence.<sup>16</sup> The abstract idea of an apple is distinct from that of an apple with a particular or idealized shape, and so the ideas have distinct nominal essences. For Locke, it is clear that general terms have nominal essences composed of abstract ideas, but where ideas come from and what they are is a matter that is not entirely disambiguated–and not for lack of effort.<sup>17</sup> I will proceed with the preliminary understanding that abstract ideas will be interrogated and found wanting.

# B. Ordinary Language and the Cosmic Machine

An often revisited example of a real essence comes from chemistry, where the molecules of a particular kind are simply the same elements in the same structural relations.<sup>18</sup> In this way, properties, such as water-solubility, can be explained away in terms of real essence, often construed in terms of composition and structure.<sup>19</sup> Further, it becomes possible to make predictions about how a particular member of a given kind would behave given conditions that the particular object had never been subjected to. Under this formulation of natural kind essentialism, scientific investigation could be construed as an effort to modify ordinary language distinctions (those based on privileged properties) so that they are defined by real properties, discovered through trial-and-error. In this manner, ordinary language is brought into

<sup>&</sup>lt;sup>15</sup> Chappell (1994), 32. Reid and Yolton reportedly take opposing sides on the matter.

<sup>&</sup>lt;sup>16</sup> Locke, (1690), III, iii, 12 & 14: 399-400.

<sup>&</sup>lt;sup>17</sup> Chappell (1994), 26.

<sup>&</sup>lt;sup>18</sup> Quine (1970), is a paradigmatic example of natural kind essentialism that proceeds in the way described; however, this is only true of "first-order" chemical kinds and does not hold for so-called "higher-order" chemical kinds such as halogens, which are differentiated based on other properties. For further discussion on this point see Dupré (2002), 36.

<sup>&</sup>lt;sup>19</sup> Again, this habit of claiming to know a real essence is contrary to the notion that Locke defined; nonetheless, it is seen notably in Quine (1970), as well as other natural kind essentialists.

alignment with scientific insights into the "interchangeable parts of the cosmic machine,"<sup>20</sup> as described above.

# 1. Epistemic and Ontological Issues

One such successful instance of science guiding the revision of ordinary language is the contemporary use of "fish," which at one point included whales as well as the other organisms presently referred to by the term. The similarities that are the basis of the present usage of "fish" purportedly include a greater proportion of real properties than the antiquated notion did. The contemporary use of "fish" includes the property of breathing water and being cold-blooded, whereas the antiquated usage was ambiguous in these respects, since whales breathe air and are warm-blooded. The notion that scientific practice might come closer to "cutting nature at its joints" constitutes an assertion of knowable and discoverable real essences to the degree that some real property (or properties) that is (or are) shared by individual fish can be used to predict or explain their further fish-y characteristics.

Repeatedly in accounts of natural kind realism, this positive epistemic point, about knowable or discoverable real properties, shows up in conjunction with the point that natural kind terms refer to groupings of real particular objects that share those properties, what I take to be an ontological point about the existence of kinds in nature. As I refer to it, traditional natural kind realism is an effort to show how nominal essences can be justifiably "linked up" with real essences such that natural kind terms refer to mind-independent natural kinds. Those who maintain that real properties, and thereby real essences, are discoverable can support essentialism and realism about natural kinds. This discussion will be resumed at length in Chapter 3. The next chapter explores how two *inclusive realist* accounts make sense of the explanatory successes of scientific inquiry that utilizes natural kinds while accounting for the growing concern that traditional natural kind essentialism has failed the sciences.

<sup>&</sup>lt;sup>20</sup> Quine (1970), 52.

# Chapter 2 – Two Ways to be an Inclusive Realist

Boyd and Dupré represent two different ways of being an inclusive realist. Boyd's kind realism primarily concerns itself with the epistemic implications of successful inferences, while Dupré is occupied by arguing that natural kinds can and should be divorced from the notion of real essences. In the following, I compare their largely definitive accounts to suggest that they should be considered together under the heading inclusive realism. Along the way I indicate the key points that will be examined in later chapters. The chapter closes with considerations on the significance of the realism component of inclusive realism. In the following two chapters, I give separate critiques of each account that should serve to show that the inclusive and realist components of each view are incompatible.

Boyd allows the nominal essences that define natural kinds to be indicative of underlying real essences but in a significantly different way than traditional essentialist accounts. He holds that nominal essences ought to reflect the messy and complex state of the world by abandoning necessary and sufficient conditions for kind membership in favor of clusters of properties.<sup>21</sup> On the other hand, Dupré targets the notion described above, the cosmic machine with interchangeable parts fully described by their real essences. Working primarily from biology, he considers variety of taxonomic and genetic essences in search of candidates that support natural kind essentialism. Finding an overwhelming number of exceptions to the traditional kind essentialist doctrine, Dupré concludes that natural kinds are intrinsically related to a purpose or goal of inquiry and consequently must be divorced from the notion of real essence.<sup>22</sup> The process by which he reaches this conclusion is examined below. Presently, I will proceed with summarizing the main points of Boyd's *accommodationism* before proceeding to give a treatment of Dupré's *promiscuous realism*.

# A. Accommodationism

# 1. Homeostatic Property Clusters and Real Essence

Boyd's treatment of natural kinds centers around the idea that necessary and sufficient conditions for kind membership—the "overly-strict relics of empiricism"—have failed to

<sup>&</sup>lt;sup>21</sup> Boyd (1991), 143.

<sup>&</sup>lt;sup>22</sup> Dupré (1993), 3-5.

describe the way kinds function in scientific practice.<sup>23</sup> He also holds that the indeterminacy of natural kind terms is required to naturalize definitions of species and proposes to utilize clusterconcepts, which indicate a number of properties roughly shared by kind members. Property cluster concepts substitute necessary and sufficient conditions for a less determinate notion of *family resemblance;* the particulars in the extension of the concept might only share *some* of the properties from the cluster. In extreme cases, two particulars from the extension might not share *any* properties other than being part of the same extension. Boyd calls natural kind terms with property cluster essences *homeostatic property clusters* (HPC); they differ from traditional nominal essences in that they indicate properties that their members *might* have rather than those that they *must* have.

The *homeostatic* component is indicative of a systemic causal mechanism which is responsible for the properties tending to cluster together. For Boyd, any general terms that make successful inferences are natural kinds. That is to say, while the privileged properties involved in defining such a natural kind term might not "carve nature at the joints," they can be said to approximate real properties when they lead to successful inferences. Therefore, natural kinds with a greater explanatory and predictive capacity are better at approximating the truth. For Boyd, the distinction between privileged and real properties is irrelevant when the general terms in question result in successful inferences. In this sense nominal essences are "linked up" with real essences. I show, in Chapter 3, that Boyd's proposal to connect loosely defined nominal essences to natural kinds is founded on an epistemic impossibility that distinguishes approximate truth and empirical adequacy. This can be seen to happen in two ways; first, in terms of the approximate truth of scientific theories, and second, in terms of the truth of a certain notion of causation. He describes the approximation of truth as occurring when *accommodation* is achieved between conceptual and causal structures.

# 2. Accommodation

Boyd uses a particularly revealing example to illustrate the relation of *accommodation* that is central to his account. He points to the success of Belding ground squirrels at avoiding predation. Based on the variation in calls they make when confronted with aerial versus terrestrial intrusions into their territory, other ground squirrels which hear one of the calls take different courses of evasive action. Boyd makes an analogy between their achievement of avoiding predation, which proceeds from different calls, and human inferential achievements,

<sup>&</sup>lt;sup>23</sup> Boyd (1991), 143.

which proceed from the different natural kind terms used in scientific theory and practice.<sup>24</sup> The existence of the *kinds* of predator that the ground squirrels' behavior differentiates between *explains* their success at predator evasion. Their conceptual structures (interpreted loosely as the calls they exhibit) are *accommodated* to the causal structures in the world (hungry aerial and terrestrial predators). In the same way, human usage of kind terms, in relation to an appropriate epistemic framework, *explains* the successful scientific inferences.<sup>25</sup> Such predictions are the precondition for the manipulations of and interventions on the environment that characterize scientific practice.

*Accommodation* is defined as a relation between a cognitive structure and the causal structure of the world, which explains explanatory and inferential success.<sup>26</sup> Cognitive structures are complex networks of terms and inferential practices. They are used to delineate the forces and entities that are the subject matter of a given discipline or purposive endeavor. To reformat accommodationism as an implication yields the sentence: if a theory is explanatorily and inferentially successful, then the relevant cognitive structures (that is, the kind terms and their relations) must be *accommodated* to (that is, they approximate) the causal structure of the world. *Accommodation* holds between causal features of the world and linguistic practices when two conditions are met:

(1) The *epistemic access condition*, as Boyd calls it, is fulfilled when the linguistic practices of a discipline (this includes classificatory as well as inferential practices) are causally related to the causal structures in the world such that there is a causally sustained tendency for what is predicated of the terms used by that discipline to be *approximately true* of the things in the world which satisfy the family of properties constituting the nominal essence of those terms. When this condition is met, a discipline has epistemic access to natural kinds.

(2) The *accommodation condition* holds that, together with (1), the causal powers of natural kinds are explanatory of any tendency for the disciplinary practitioners to identify law-like

<sup>&</sup>lt;sup>24</sup> Boyd (2010), 214-5 & 221.

<sup>&</sup>lt;sup>25</sup> The reality of a natural kind is based on it playing an epistemically legitimate role in some scientific practice (Boyd 2010, 222). Boyd also emphasizes "social, economic, political, and cultural factors" in considering whether epistemic practices are suitably reliable for realism (Ibid, 218). In a way, this could support a revisionary reading of Boyd's realism that brings it closer to the conceptual inevitability that I ascribe to Dupré.

<sup>&</sup>lt;sup>26</sup> Boyd, (1999), 147.

generalizations, make correct explanations, and produce successful solutions to practical problems.<sup>27</sup>

Homeostatic property cluster natural kinds are *accommodated* to causal structures to the degree that the cognitive structure produces accurate and reliable predictions. In this way, accommodationist natural kinds are explanatory of epistemic achievements.

I take it to be the case that (1), the epistemic access condition, is the most important part of the accommodationist proposal. Immediately, I would like to highlight the repeated use of the notion of causation in (1). Boyd's original text also uses the notion three times in a row and I believe that is because of the central role that causation plays in his response to constructivist concerns. This is the target of the latter half of Chapter 3. The first half of that chapter is concerned with the notion of approximate truth used in (1). I show that neither his response to constructivist concerns nor the notion of approximate truth can be consistently upheld.

## 3. Natural Kinds

"A natural kind is nothing (much) over and above a natural kind term together with its use in the satisfaction of accommodation demands. ... Or, better yet, the *establishment* of a natural kind *consists solely in* the deployment of a natural kind term in satisfying the accommodation demands of a disciplinary matrix."<sup>28</sup>

"Natural kind," as Boyd uses it here, seems to denote something importantly different between the two proposed definitions. In the first case, natural kind terms are instances where linguistic practices approximate real causal structures. In the second definition, a natural kind is something to be *established* rather than discovered. It seems like the second description is of a natural kind *term*, not a natural kind in the relevant sense of a mind-independent division in the world. This seems to follow given the way Boyd proposes to connect privileged properties to real properties. However, exactly what it is that constitutes "satisfying the accommodation demands" will determine whether these two definitions are true and equivalent. Satisfying accommodation demands leads to the epistemic access condition and thereby to the notion of approximate truth. As I elaborate on in the next chapter, it is indeterminable whether successful theories approximate reality or are empirically adequate but false. In other words, epistemic access is ambiguous. Presently, it is important to underline that Boyd determines the ontological status of natural kinds based on a given discipline fulfilling the accommodation

<sup>&</sup>lt;sup>27</sup> Boyd (2010), 215.

<sup>&</sup>lt;sup>28</sup> Ibid, 220.

demands, which include the *epistemic access condition*. In the next chapter, I show that this condition requires a two-fold commitment to knowable real essences, once for approximate truth and once for causation. This commitment is brought into question by concerns expressed by Dupré, whose account I will now turn to.

# B. Promiscuous Realism

# 1. Scientific Practice and Ordinary Language Distinctions

The example from the previous chapter, of the kind term "fish" before and after the scientific decision to exclude whales, illustrates a point about the possible role of scientific practice in language use and development. If it is reasonable to commit to real essences, and scientific practice discovers real essences, then the natural kind essentialists point, that scientific practice establishes an objective sense of similarity which has the potential to enhance the precision of ordinary language distinctions, stands on firm ground. However, if either a commitment to real essences or their discoverability fails, then scientific practice is in no position to modify ordinary language distinctions without independent reasons to support such changes. Dupré explores numerous examples of partially overlapping means of categorizing things in the world, arguing it is neither the case that a commitment to real essences nor to science's ability to discover them is tenable.<sup>29</sup>

One such example is of the ordinary language term "lily," which shares a genus (*Liliaceae*) with many other flowers. Further, *Liliaceae Allium* is a genus that includes many species of onion and garlic. In this case, there is a greater diversity of commonly used terms than the genus designation distinguishes. Conversely, in the case of cedars, disparate species are grouped together though they belong to different genera. Dupré suggests that this is because the relevant concern, reflected in the vernacular categorization, is with the cedar *qua* timber rather than *qua* biological organism.<sup>30</sup> In both cases the commonly used term does not come into accordance with the biological classification, and bringing it into accordance, in the same way that whales were excluded from "fish," would constitute "a debasement of the English term" as well as a hindrance to chefs and loggers alike.<sup>31</sup> Dupré suggests that the reason for such diversity of categorical schemata is that each set of terms is suited to a specific purpose. What follows is that adapting ordinary language terms to those produced by scientific

<sup>&</sup>lt;sup>29</sup> Dupré (1993), 61.

<sup>&</sup>lt;sup>30</sup> Ibid, 31-2.

<sup>&</sup>lt;sup>31</sup> Ibid, 28.

theorizing overrides the purposes for which ordinary language distinctions were made to emphasize. He suggests that these various purposes should be embraced non-hierarchically, and therefore, scientific theorizing is not *a priori* in a position to modify ordinary language distinctions.

# 2. Ordinary Language, Branches of Scientific Practice, and Pluralism

If Dupré's point about purposiveness holds, then those who take it as the task of science to bring greater precision to everyday language implicitly affirm the purpose or purposes of scientific practice as primary to those of ordinary language. This results in privileging the properties emphasized by scientific practice. However, Dupré makes the point diversity in purposes and interests is responsible for at least some of the divisions between branches of natural science, such as ecology and evolutionary biology.<sup>32</sup> For example, in an ecological investigation, one organism might be grouped with others that are prey for wolves, together constituting an ecological kind. On the other hand, for the purpose of studying evolutionary descent, that same organism might be grouped with a different group of organisms which all share a common ancestor, together constituting a clade or evolutionary kind. In other words, promiscuous realism is at odds with the distinction between privileged and real properties, as any property that is privileged by some purpose just is a real property. This amounts to a rejection of real essences because no set of terms is uniquely suited to explanation and prediction of every property that might be important to a given purpose.

Between sciences, one might classify something as "a real whale, a real mammal, a real top predator in the food chain, and even a real fish."<sup>33</sup> The core of Dupré's pluralist argument is that each of these classifications is equally intelligible in relation to the purpose of their native disciplines, and so they are all natural kind terms. Intelligibility plays a decisive role in Dupré's arguments for justifying ordinary language distinctions as well as those drawn by different scientific and even political purposes.<sup>34</sup> A particular discipline need only recognize those distinctions which are relevant to its purposes *and not more*. This is because the intelligibility of those distinctions depends on its being framed by a purpose. Since the purposiveness of each discipline limits the kind distinctions which are intelligible within its framework, no single

<sup>&</sup>lt;sup>32</sup> Ibid, 37.

<sup>&</sup>lt;sup>33</sup> Ibid, 262.

<sup>&</sup>lt;sup>34</sup> Ibid, 28, 43, & 77.

discipline can serve to explain the kinds relevant to every discipline.<sup>35</sup> This is part of a position Dupré calls *categorical empiricism*.

# 3. Categorical Empiricism

"[T]here is no more to the discovery of a kind than the discovery of the correlations of properties characteristic of the members of a kind. If one did suppose that one had at the same time as discovering the kind also discovered the essence of the kind, one would thereby have additionally determined the extension of the kind."  $^{36}$ 

Categorical empiricism holds that, while it may be possible that real essences for natural kinds exist, commitment to them is not justified *a priori*.<sup>37</sup> That is to say, for example, it is unjustified to assume that the behavior of biological kinds can be explained or predicted by knowing the physical kinds that compose them. His suggestion is that whenever a term unifies distinct individuals under the heading of a single kind, the utility of that kind is a function of the purpose it presupposes. What Dupré is advocating is not so extreme as to outright deny the possibility that real essences might exist, but rather just that the universe cannot be assumed to be a cosmic machine with fundamentally interchangeable parts.<sup>38</sup> Without justifying a commitment to real essences, in the sense of the traditional natural kind essentialist, not only is it not the clear role of science to bring greater precision to ordinary language, but it is unclear that any particular branch of science can bring greater precision to any other branch.<sup>39</sup> Categorical empiricism is the position that such real essences cannot be assumed to exist. Therefore, natural kinds must be reconceived without them.

The non-hierarchical coexistence of purposes and natural kind distinctions constitutes the *promiscuous* side of Dupré's position; maintaining *realism* in conjunction with such pluralism results in *promiscuous realism*.<sup>40</sup> However, exactly what Dupré means by *realism* remains to be seen. Below, I offer two possible formulations.

<sup>38</sup> Ibid, 22.

<sup>&</sup>lt;sup>35</sup> Ibid, 67.

<sup>&</sup>lt;sup>36</sup> Ibid, 61.

<sup>&</sup>lt;sup>37</sup> Ibid, 80.

<sup>&</sup>lt;sup>39</sup> Dupré (2002), 40-1, also (1993), 29-30, 80-4.

<sup>&</sup>lt;sup>40</sup> Dupré (1993), 18.

# 4. Reference Realism

For Dupré, natural kind membership for particular objects depends on the "real, objective properties of the objects."<sup>41</sup> Dupré cites the reality of the members of a kind as sufficient for the reality of a kind, further indicating that the reality of kind terms comes in degrees. One can imagine a spectrum, along which classificatory schema can fall anywhere between "trivial," when sharing only one real property, to "very predictive and explanatorily powerful," when sharing a large number of real properties. When kind membership entails more shared properties and the kind term is known to have an extension, then the kind is more real than those with fewer shared properties or kind terms with no extension.<sup>42</sup> I will call *reference realism* any kind realism that is based on the idea that a kind term refers to particular objects by their real properties. This is one way in which Dupré might be considered a kind realist.

# 5. Conceptual Inevitability

*Conceptual inevitability* is another possible construal of Dupré's kind realism. It is a sort of determinism about empirical and linguistic practices, as contextualized by historical situations. While Dupré does not explicitly endorse it as the realism he intends, it is another promising route to take from his considerations to kind realism and accords with his remarks about the existence of optimal kind terms for a given purpose. The position holds that if two or more disparate groups are approaching some problem from appropriately similar circumstances and with appropriately similar methods and purposes in mind, then they will inevitably converge on the optimal kind term.<sup>43</sup> Such convergence serves to *naturalize* the kind terms. I will call this variety of realism *conceptual inevitability*. In Chapter 4 I liken this approach to Popper's notion of *objective knowledge* and show that starting from notions also utilized in Dupré, namely the intelligibility of linguistic classifications and the historical embeddedness of scientific theories, Popper reaches a sense of mind-independence that has much in common with this understanding of Dupré's realism.

# 6. Conflict Between Pluralism and Realism

Dupré frequently asserts that his arguments for pluralism do not conflict with kind realism.<sup>44</sup> However, it is unclear what to think about these kinds if there never were creatures like humans

<sup>&</sup>lt;sup>41</sup> Ibid, 17-8.

<sup>&</sup>lt;sup>42</sup> Dupré (2004) 76-7.

<sup>&</sup>lt;sup>43</sup> Dupré (1993), 52.

<sup>44</sup> Ibid, 36, 57, 63, 104.

or anything like their purposes to make reference to (I will refer to this as the objective universe counterfactual for ease of reference). What is worrisome about Dupré's realism is that the referent of such terms *does not exist such that*, under the objective universe counterfactual, the term in question successfully refers. If nothing else, there is an understandable distinction between terms that would and would not qualify as referring in such circumstances. Such a counterfactual is relevant to the extent that a realist can assert that there is a fact-of-the-matter about the kinds of things, such as protons or population III stars, in the early universe before the evolution of life.<sup>45</sup> If there is a fact-of-the-matter, then the kinds must have referents even without purpose having creatures like humans. In Chapter 4, I revisit Goodman's suggestion to use the term *relevant* kinds as a way of emphasizing the relationship to purposes which is shown here. Goodman's more radical rejection of real properties relativizes all properties and particulars, as well as kind distinctions, to purposes, thus raising concerns for reference realism. Despite how Dupré downplays the possibility that pluralism might contradict kind realism, some unaddressed concerns about the extent of his rejection of real essences present themselves. Furthermore, in Chapter 4 I show that neither reference realism nor conceptual inevitability can manage to avoid assuming the existence of real essences.

# C. Inclusive Realism

#### 1. Comparison

Both Boyd and Dupré emphasize that nominal essences are the product of scientific investigation and that natural kind terms and the general laws that they are involved in constitute knowledge of reality, but they proceed in importantly different ways. The first step for Dupré consists of showing that different terms are suitable for different purposes. He then proceeds to a rejection of any commitment to real essences by showing that, in my reconstruction, even if there is some purpose (P) for which the set of terms suitable to P,  $\{T_0, T_1...T_f\}$ , are also suitable to every possible purpose, then without already knowing  $\{T_0, T_1...T_f\}$ , commitment to a thesis that requires their discovery is premature. As it stands, there is no evidence for P, so it is not possible to conceive of  $\{T_0, T_1...T_f\}$ , any commitment to real essences is premature.

For Boyd, the starting point is the success of inferential practices despite linguistic vagueness. This success is attributed to tracking the causal structure of the world, leading to a

<sup>&</sup>lt;sup>45</sup> Meillassoux (2008), makes this point in discussing what he calls the problem of ancestrality.

reformulation of nominal essences without necessary and sufficient conditions. Boyd does not explicitly address the question of real essences, but as I show in the next chapter, his position requires commitment to them. Boyd accepts that language is effective, though dull and imprecise; Dupré says that we sharpen natural language only as much as is needed for a given purpose of inquiry. Both enlarge the notion of natural kind. Boyd includes kinds without sharp boundaries, and Dupré argues for natural kinds at every level of scientific inquiry as well as outside of scientific practice. This is the inclusive component of inclusive realism. The realist component, as indicated above, is manifested differently in both accounts. Boyd takes natural kinds to be real insofar as they explain epistemic achievements by being parts of conceptual structures that are appropriately accommodated to the causal structure of the world; they approximate reality. On the other hand, Dupré can either take "real" to mean different things when applied to particulars and properties as opposed to kinds. In which case his realism is characterized by reference realism. I also suggested an alternative reading of Dupré's kind realism which takes "real" to indicate the socially and historically inevitable concepts which have a superlative capacity for serving a particular goal in a "real and recalcitrant" world. In the latter case, his claims to kind realism are substantiated by the so-called notion of *conceptual* inevitability.

# 2. Trajectory

In Chapter 3, I address my primary concerns with accommodationism, namely that the epistemic access condition cannot be fulfilled because it requires a questionable commitment to real essences. Further, I show that even granted such a commitment, it would be impossible to determine that the epistemic access condition had been fulfilled because of arguments made by Sober against the "No Miracles" argument for scientific realism. This leaves only one option for Boyd's realism, which is to adopt a notion of "real" based on either conceptual inevitability or reference realism, as described above. Then in Chapter 4, I show how conceptual inevitability and reference realism, exemplified by Dupré and Popper, directly conflicts with a consistent rejection of real essences. Goodman's pluralism will then serve as an example of consistently rejecting real essences. I show that his identification of world-versions with actual worlds is what Dupré lacks. I take this point to establish that inclusive realism cannot be sustained.

# Chapter 3 – Accommodationism, Real Essences, and Empirical Adequacy

# A. Approximate Truth, Real Essences, and Epistemic Access

For Boyd, the accommodation demands of a disciplinary matrix must be satisfied to establish a natural kind.<sup>46</sup> These demands consist of the two conditions described above, the epistemic access condition and the accommodation condition. The latter derives much of its force from the epistemic access condition, and adds an emphasis on the causal role of HPC natural kind terms in successful inference and intervention. In other words, if no such terms were used, the successes would not occur. The accommodation relation is largely substantiated by the epistemic access condition, so my focus remains on this point. This condition requires that there is a "systematic, causally sustained tendency," resulting from "causal relations" between disciplinary practices and causal structures in the world, for whatever that discipline predicates of its terms to be *approximately true* of things in the world.<sup>47</sup> This condition must be satisfied *before* the accommodation relation holds between conceptual structures and the world.

One point in opposition to the notion of approximate truth is that the relation relies heavily on the idea that there is some set of absolute descriptions, i.e. real essences, with which to compare the nominal essences of a discipline's kind terms. This point can be seen again in the examples that Boyd uses to illustrate how "wrong" theories can get some things "right." He contrasts these examples with modern scientific theories: alchemical uses of "sulfur" and "mercury" are acceptable as natural kind terms because of their similarity to contemporary use of the terms in modern chemistry; ancient astronomical texts can be interpreted as referring to modern terminological counterparts;<sup>48</sup> and the ground squirrel calls correspond roughly to ecological natural kinds.<sup>49</sup>

# 1. "Approximately True"

In the examples cited above, alternative, wrong terms (alchemical or ancient astronomical concepts, ground squirrel calls) can be compared with the contemporary, right terms to show

<sup>&</sup>lt;sup>46</sup> Boyd (2010), 220. See block quote above, Chapter 2, section A3.

<sup>&</sup>lt;sup>47</sup> Ibid, 215.

<sup>&</sup>lt;sup>48</sup> Ibid, 228.

<sup>49</sup> Ibid, 214.

that naturalists of antiquity (or ground squirrels) satisfy the epistemic access condition. However, this gives no guidance for how to establish the epistemic access condition regarding the modern terms themselves because these examples only serve to show that there are modern terms that roughly correspond to older terms. The epistemic access condition requires that practices and causal structures be causally related such that there is a tendency to generate approximately true sentences. Perhaps the point is most prominent when, in comparing accommodationism with semantic role theory, Boyd says that accommodationism is concerned with "what scientists are actually accomplishing," as opposed to what "they (perhaps only tacitly) believe they are accomplishing with respect to induction and explanation."<sup>50</sup> In the example of the alchemical use of "sulfur" and "mercury," a modern chemist can look at what was "actually" accomplished only because she utilizes a set of distinctions that account for alchemy's explanatory and predictive successes, as well as many of its failures. However, the accusation is that the modern chemists' set of distinctions does not have a clear sense in which it is *actually* accomplishing without some further set of distinctions that can account for *her* successes and failures as well as those of any other possible set of distinctions. Such a set of distinctions requires a mode of description that is a-historical, value-free, and absolute. The natural kind distinctions of that mode would be fully explanatory and predictive. In other words, the terms it utilized would have to be defined by none other than Lockean real essences.

## 2. Real Essences and Epistemic Access

Boyd's response to the pluralist concern that occupied Dupré—that all kind terms are inextricably bound to some mind-dependent purposes—seems to be cursory at best. He asserts that because human (and ground squirrel) purposes and concerns are real, then so are the kinds that they refer to when developing systems of terms to address those purposes and concerns.<sup>51</sup> This can result in the sense of "real" as inevitable given the appropriate circumstances,<sup>52</sup> which I call conceptual inevitability, or it can take the reality of particular objects and their properties to substantiate the reality of the kind terms, which I call reference realism. Responding to these two forms of realism is a main point in Chapter 4. Boyd's commitment to real essences comes from the epistemic point—central to his *accommodationist picture*—that inductive success indicates an underlying causal mechanism. First, I address this epistemic point, that there is a

<sup>&</sup>lt;sup>50</sup> Ibid, 227.

<sup>&</sup>lt;sup>51</sup> Ibid, 221.

<sup>&</sup>lt;sup>52</sup> This reading is certainly not very far from what Boyd writes, for example: "...questions about the reality of (alleged) natural kinds should always be understood as questions about the suitability of those kinds for induction and explanation *in particular disciplinary matrices.*" (Ibid, 222)

clear route from inductive success to approximate knowledge of causal structures. Then, I address what he calls the "no non-causal contributions" reply to constructivism, showing it to beg the question against the constructivist regarding the notion of causation.

# B. Empirical Adequacy

As shown above, the epistemic access condition requires that a discipline tends to generate approximately true sentences and that doing so implies that there are real essences. The problem is that establishing some discipline as having a tendency to generate approximately true sentences is impossible because, without the privileged perspective of *already* knowing what the real essences are, there is no way to determine whether the sentences generated are approximately true or merely *empirically adequate* but false.

Two theories are empirically equivalent when they make the same predictions about observable consequences but differ substantively regarding the unobservable dynamics that bring those consequences about. *Empirical adequacy* is the notion that the natural kinds proposed by some theory could be empirically equivalent to the real essences in nature. This equivalence cannot be mere notational variation, but it must be rooted in substantive differences between the kinds of entities and relations postulated and those that exist mind-independently. Sober considers whether scientific practices are oriented to approximate reality or generate empirically adequate sentences, taking the "No Miracles" argument as his starting point.<sup>53</sup> The argument proceeds by abduction; the successes of scientific inferences are best explained by the ability of scientific theories to approximate reality. Since any other explanation for the successes of scientific inference would require a "miracle," it is reasonable to conclude that the natural kind terms used in making predictions approximate the real divisions in nature. That is to say, the nominal essences of natural kind terms approximate the real essences of natural kinds.

# 1. Setting-up Sober's Analysis

Sober proceeds by considering a given theory T, which has made successful inferences, and characterizes the scientific realist proposal to account for its success as:

(a) T is true, or approximately true.

<sup>&</sup>lt;sup>53</sup> Sober (1990), 394 & 396.

A contrasting proposal could be formulated using empirical adequacy:

(b) T is empirically adequate, but false.<sup>54</sup>

For convenience I will refer to (b) as the *contrastive empiricist proposal*, after the position Sober advocates. Sober proceeds by using Bayesian confirmation theory to contrast the two proposals. Bayes' theorem calculates the probability of a hypothesis (H) given an observation (O) as follows:

$$Pr(H|O) = Pr(O|H)Pr(H)/Pr(O)$$

Contrasting the two hypotheses, (*a*) and (*b*), about theory T, given the observation (O) that T has made a successful inference, can be formulated as follows:

#### Pr(a|O) ? Pr(b|O)

Where the question mark is replaced by a greater than, less than, or equal sign, indicating which probability is higher, given the observation. Substituting the formulas for the probabilities yields the relation:

$$Pr(O|a)Pr(a)/Pr(O) > Pr(O|b)Pr(b)/Pr(O)$$
, when (a) has a higher probability.<sup>55</sup>

A probability of 50% would be entered in the formula as .5 and calculated accordingly. Since the two proposals are about a successful inference *that has already happened*, the probability of the observation is 100%, represented by a value of 1. Pr(O) occurs in the denominator, and dividing by 1 has no effect, so the relation becomes:

Pr(O|a)Pr(a) > Pr(O|b)Pr(b).

Pr(O|a) is the probability of the observation of a successful inference when T is true or approximately true. While Pr(O|b) is the probability of the observation of a successful inference when T is empirically adequate but false. For some theory to be empirically adequate means that it makes all of the same observable predictions as the approximately true theory in question, but does so using terms and relations that do not correspond to the actual state-ofaffairs. Therefore, both Pr(O|a) and Pr(O|b) are equal because whether T is empirically adequate or approximately true is indistinguishable by definition. The predictions made by T,

<sup>54</sup> Ibid, 397.

<sup>&</sup>lt;sup>55</sup> Ibid, 398.

under the circumstances of (a) or (b), are exactly the same, so the probability of observing a successful inference must be equal.

#### 2. Hypothetical Prior Probabilities

Given that Pr(O|a) and Pr(O|b) are equivalent, whatever their value might be is inconsequential to contrasting their respective probabilities. What remains is the probability of (a) and the probability of (b). These values are called *hypothetical prior probabilities*, or hypothetical priors, and are stipulated based on independent evidence and *a priori* reasoning. This means that the "No Miracles" argument, which asserts that Pr(a) > Pr(b), depends on an *a priori* argument that T is true or approximately true in order to obtain.<sup>56</sup>

The same pattern of indeterminacy can be seen between Einstein and Lorentz's interpretations of the Lorentz transformation laws; Einstein holds that spacetime changes and methods of measurement remain constant relative to their inertial frames, while Lorentz maintains that spacetime is absolute and accelerations affect the lengths of measuring rods and speed of clocks. In both cases, the natural kind being described (spacetime) changes dramatically in character, but the two theories make identical predictions about the relative values of measurements in different inertial frames. In biology a similar case can be seen in the debate over whether species are kinds or individuals. If species are individuals, then the problem of variation over the course of evolution, cited above, is dissolved because individuals can change over time without losing their identity; however, new issues emerge with how to do ecology without different kinds of organisms.<sup>57</sup> If species are kinds, then the issue with evolution resurfaces, but ecology proceeds with business as usual. However, the two pictures might generate indistinguishable predictions.

For example, if species are individuals, populations of a species could be reconceived as the health or body mass of an individual at a particular time, allowing ecology to make the same predictions as when species are kinds and populations are instances of a kind. The pictures used to conceptualize species or spacetime in the above examples vary wildly, yet the variation makes no difference to the predictions that follow. Choosing between such pictures is indeterminate. Likewise, Sober cites the indeterminacy indicated by Reichenbach between a non-Euclidian universe with normal physics and a Euclidian universe with universal forces.

<sup>&</sup>lt;sup>56</sup> Ibid. 399.

<sup>&</sup>lt;sup>57</sup> Dupré (1993), 20.

Any decision to take one or the other of these theories relies on hypothetical priors, which are often empirically untestable. <sup>58</sup> The point is the same with choosing between the two explanations, (*a*) and (*b*), of some theory's inductive successes. It is indeterminate whether a given scientific theory that has made a successful inference is approximately true or empirically adequate but false.

# 3. Epistemic Access Revisited

This indeterminacy may not appear very concerning by itself, granted that if a theory makes good predictions it should not matter much whether it is approximately true or only empirically adequate. While that may stand as a practical attitude towards scientific theories, in the context of the accommodationist proposal, such indeterminacy is a serious threat to the epistemic access condition. Epistemic access requires that what a discipline predicates of its terms tends to be true or approximately true of things in the world, and Sober's analysis reveals that whether the most inferentially successful theories approximate reality or are empirically adequate but false is indeterminate and cannot be established empirically. This is what I will call an *ambiguity of epistemic access*. Without an *a priori* motivation to accord a higher probability to support for the realism accommodationism allegedly argues for, the epistemic access condition can never be determinately satisfied, and the accommodation relation never holds between any conceptual structure and the causal structure of the world. To maintain otherwise constitutes an abuse of hypothetical priors.

# C. Non-causal Contributions

Boyd attempts to avoid this accusation by arguing that when two pictures, like Einstein and Lorentz's notions of spacetime, make the same predictions, embodied in this example by their shared use of the Lorentz transformations, the two versions are arbitrary variations. Both are true facts sustained by causal mechanisms.<sup>59</sup> His approach advocates a "radical contingency" of both scientific and philosophical methods that holds successful inference as the only gauge of truth. He is also aware that this results in a diminished sense of "real," because what is real is simply what has produced successful inferences.<sup>60</sup> While the social constructivist will argue that successful inference is insufficient for realism because the terms are products of inescapably biased background assumptions, Boyd maintains that successful inference must be

<sup>&</sup>lt;sup>58</sup> Sober (1990), 402.

<sup>&</sup>lt;sup>59</sup> Boyd (1990), 364.

<sup>&</sup>lt;sup>60</sup> Boyd (2010), 222.

maintained by causal mechanisms. Therefore, whatever flawed background assumptions might be involved, the terms are getting *something* right when they produce successful inferences. This is what he means by *no non-causal contributions*. The historically contingent ways in which kind terms are produced, with all of their inaccuracies, do not affect the approximation of truth by the theories they are involved in because causal mechanisms must underlie the successful inferences those theories produce.<sup>61</sup> This formulation of approximate truth is quite appealing; it seems to account for the concerns that result from historical inaccuracies while still maintaining that there is something to get right, and at its best, scientific practice can get close to it.

# 1. Causation and Constructivist Concerns

Nonetheless, this still is subject to a constructivist concern about the notion of a causal mechanism itself. Newtonian physics is largely the investigation of a particular notion of causation as sequences of events that proceed asymmetrically through time. However, it is a notion of causation that is not designed to account for the many levels that are the object of scientific inquiry. Some, such as quantum mechanics, require very different notions of causation, where events in the future can cause events in the past.<sup>62</sup> This point shows that Boyd's suggestion that causal mechanisms must underlie successful inferences is not innocent, and in fact, relies on the non-causal contribution of the conception of causation from classical mechanics. If it is the case that causation can be conceived in different ways such that successful inferences are possible without the conceptual structures involved in approximating truth, then Boyd's objection to constructivism fails and approximate truth is an untenable solution.

Unfortunately for the accommodationist proposal, many such conceptions are available. Not only might it be the case that photons turn into electrons that move backwards through time and create themselves, but this challenge includes theist proposals which hold that all the appearance of causation is just a manifestation of divine will. It includes radical interpretations of the Russell hypothesis, which hold that the present moment, with all its semblance of proceeding from previous moments and becoming into future moments, is actually metaphysically isolated from any other moment, and what is interpreted as causation is simply a single state-of-affairs. Many more such theses are available, and the fact that they might *seem* 

<sup>&</sup>lt;sup>61</sup> Boyd (1990), 370.

<sup>&</sup>lt;sup>62</sup> Khalidi (2011), 1160. See also Feynman (1985).

incredibly unlikely is not *a priori* reason for their dismissal precisely because of the *ambiguity of epistemic access* described above. It is indeterminate, without already knowing what is the case, whether our notion of causation is approximately true or empirically adequate but false. This establishes that the notion of causation that Boyd relies on begs the question against constructivism. It cannot serve as a response to the accusation that approximate truth involves an abuse of hypothetical priors because the notion of causation he relies on is the non-causal contribution of a social and historical situation, and so it is unfit to serve as a foundation from which to reject constructivism. Because neither the notion of approximate truth nor causation can serve to establish the accommodationist picture of kind realism, I suggest that Boyd's only options are to proceed to either reference realism, conceptual inevitability, or a rejection of kind realism.

# 2. Trajectory

The weakened sense of "real," embodied by reference realism and conceptual inevitability, remains an option for Boyd, but the accommodation demands would have to be significantly altered so that they no longer rely on approximate truth, which implies a commitment to real essences and an abuse of hypothetical priors. In the next chapter I show how both kind realist options *still* imply a commitment to real essences. Barring any further possible interpretations of kind realism, I take these arguments to establish the incompatibility of the inclusive and realist components of inclusive realism.

# Chapter 4 – Properties and Pluralism

# A. Two Realisms, Two Pluralisms

#### 1. Inevitable Concepts and Real Referents

In this chapter, I first examine the notion of conceptual inevitability, the idea that given sufficiently similar circumstances and purposes, disparate groups will converge on the same theoretical kind terms and general laws. I take it to be one possible way for Dupré to maintain realism about natural kinds. Conceptual inevitability is a form of realism which has much in common with Popper's theory of objective knowledge. I show that, like Dupré, Popper starts with the notion of linguistic intelligibility and the fact that scientific theories are embedded in social and historical contexts and find that a robust sense of mind-independence of natural kinds is implied.

I then proceed to consider the notion of reference realism, the idea that when a kind term refers to real objects by means of their real properties, the kind is real. This is another way in which Dupré might be considered a kind realist. I show that, without some sort of fortification to justify the identification of privileged properties with real properties, both reference realism and conceptual inevitability are ultimately incompatible with a rejection of real essences.

# 2. Moderate and Radical Pluralism

Dupré's pluralism bears a remarkable similarity to Goodman's nominalism, which proceeds from a rejection of real essences and results in identifying a particular *version* or coherent description of a world with the world of real *objects*. Dupré's point that every branch of science develops its own, non-reducible, general terms in relation to a given purpose is a pluralism of *versional* worlds, in Goodman's terms; however, I suggest that there is an implicit commitment to real essences in Dupré's realism which restrains him from making the same identity between *versional* and *objectual* worlds that characterizes Goodman's pluralism. This establishes that a consistent rejection of real essences is incompatible with kind realism, understood as either conceptual inevitability or reference realism.

# B. Dupré and the Three Worlds

Dupré does not identify with the sociology of knowledge movement which holds that goals, interests, and prejudices are entirely constitutive of scientific theories; rather, he holds that the production of scientific theories comes from interaction with a "real and sometimes recalcitrant world."<sup>63</sup> To make sense of this position, I proposed that Dupré's kind realism might take the form of conceptual inevitability. I show that this suggests Dupré's realism implicitly distinguishes between objective reality and claims about it, countenancing at least two distinct realms or worlds as real. Similarly, Popper proposes a three world system that proceeds from notions of linguistic intelligibility and historically embedded purposive investigation, notions also utilized by Dupré. Popper develops a structure of autonomous and interrelated realms based on these notions. I proceed by outlining the structural relations of Popper's worlds with reference to parallel tendencies in Dupré's arguments.

# 1. World One and Two

Popper's three worlds are not metaphysically isolated but interact through the agency of human beings. The basic relational structure is as follows: world-one, the world of objects in themselves, causally gives rise to world-two, the world of cognition and reflection. In turn, world-two exerts causal force over world-one, changing it in accordance with purposes and desires. World-two accesses and creates what Popper calls *objective knowledge* world-three, thereby enhancing the ability of subjective knowers to affect world-one.<sup>64</sup> Taking world-one as the first point of comparison, in the background to Dupré's pluralism, is always the notion that objects are, in themselves, real and differentiated entities that are grouped into kinds according to various purposes. One example, quoted partially in Chapter 2, proceeds as follows: "*A certain entity* might be a real whale, a real mammal, a real top predator in the food chain, and even a real fish. Many, perhaps all, of these designations might be the appropriate characterization of *that object* for some legitimately scientific purpose."<sup>65</sup> This division, between the purposive characterizations of an object and the object itself, acknowledges that particular objects are mind-independently real in the same sense as Popper's world-one.

World-two enables the interaction between world-one and world-three and is constituted by subjective thoughts, experiences, and purposes. Because of the importance Dupré confers on

<sup>&</sup>lt;sup>63</sup> Dupré (1993), 13, also (2004), 76.

<sup>&</sup>lt;sup>64</sup> Popper (1972), 155.

<sup>&</sup>lt;sup>65</sup> Dupré (1993), 262 (emphasis added).

human purposes for producing natural kinds, it seems reasonable that those purposes are themselves real, although not in the sense that they are mind-independent. Rather, they are real in the sense that they are irreducible features of the universe. For the natural kind realist that takes the route of conceptual inevitability, purposes occupy the same position as world-two does for Popper, mediating between objects themselves in world-one and the world-three objects-the natural kinds-that characterize them. However, the interesting issue as to whether or not this is distinct from world-one falls outside of the scope of this thesis.

World-one can capture the notion of reference realism, as long as there are world-one entities to which kind terms refer, those groupings are real kinds. This will be examined in conjunction with Goodman's proposal. In the remainder of this section, I show that, insofar as Dupré's kind realism can be characterized by the notion of conceptual inevitability, natural kinds are real in a sense that is parallel to the objectivity of knowledge in Popper's world-three.

#### 2. World Three and Conceptual Inevitability

World-three is an objective realm of knowledge that is accessed by, but in no way dependent on, subjective knowers. In one effort to illustrate this autonomy, Popper offers the example of a book of automatically generated logarithms that is never read by anyone. It would be appropriate, he suggests, to consider this book as containing knowledge, although it was neither produced by humans that subjectively knew its content nor was it read and known by any subject.<sup>66</sup> There is a contemporary example of such knowledge in the data produced by supercomputers that perform meteorological computations.<sup>67</sup> The objective knowledge is present in the sense that the calculations are being performed but are rarely, if ever, interpreted by a subject directly. Yet the resulting data is the basis for a wide range of inferences, from the flight path of a commercial airliner to the decision to carry an umbrella. It is no coincidence that the mind-independence Popper attributes to human knowledge finds its most comprehensible expression in mathematics. The progression of real numbers proceeds as though on "rails invisibly laid to infinity," which allow for all manner of mathematical manipulations to proceed as if "all the steps were already taken."68 This exemplifies the sense in which world-three is mind-independent.

<sup>&</sup>lt;sup>66</sup> Popper (1972), 115.
<sup>67</sup> Edwards (2001), 55.

<sup>68</sup> Wittgenstein (1958), §218-9.

To connect the mind-independence of world-three to conceptual inevitability, Popper's notion of a *problem situation* provides the historical context that embeds scientific investigations. A problem situation is the state of world-three objective knowledge available to a historically situated individual pursuing a new explanation or approaching a practical problem. A problem situation puts limitations on the possible natural kind terms that could be utilized or developed by that individual, in virtue of the fact that the problem is characterized by previously developed theoretical terms, including the theory-laden language in which the problem is formulated.<sup>69</sup> Conceptual inevitability about natural kinds is the thesis that—based on the state of world-one and world-two—a single, best description of particular things in general terms follows from a problem situation in the same determinate manner as a mathematical calculation. If natural kinds are the inevitable result of the real, historically contextualized, human purposes in a real world, then whether or not they are utilized as part of a theory is secondary to their existence as world-three objects.

# 3. Conceptual Inevitability and Triviality

Kind realism based on conceptual inevitability seems to allow one to maintain the mindindependence of conceptually inevitable natural kinds that was challenged in Chapter 2 by the so-called objective universe counterfactual. For any possible state of world-one and -two, given a problem situation, mind-independent natural kinds exist in word-three, which are best suited to the relevant purposes under consideration, whether or not there factually are any knowing subjects. However, it is at a price that Dupré might be unwilling to pay. The "rails invisibly laid to infinity," which seem to appropriately characterize the mind-independence of worldthree objects, require a notion as to what it is to do *the same thing*.<sup>70</sup> I show below that doing *the same thing* involves privileged properties and cannot involve real properties. However, for conceptual inevitability to distinguish natural kinds from other kinds requires that doing *the same thing* is based on real properties. Therefore, I conclude that kind realism based on conceptual inevitability trivializes natural kinds.

The infinite progression of numbers, which serves to exemplify the mind-independence of world-three, depends on a practice of counting. The practice of counting is simply the act of following a rule, putting one numeral after another in an order which has already been decided

<sup>&</sup>lt;sup>69</sup> Popper (1972), 165.

<sup>&</sup>lt;sup>70</sup> Wittgenstein (1958), §226-8.

on and put into practice.<sup>71</sup> Following a rule amounts to doing *the same thing*. If one produces the same sequence of numbers as dictated by the rule, then, for all intents and purposes, the rule has been followed.<sup>72</sup> However, this divorces the sequence of numbers from the mindindependent sense that Popper uses; the symbols or sounds produced must accord with some rule for their production which makes them the same. These symbols accord with a rule when their relevant features are reproduced; I might write the numbers one through ten as Greek or Roman numerals, as a sequence of dots or in binary code. Further, one might conceptualize them as Platonic forms, sets, or illusory social constructions without deviating from the rule which makes the sequence produced *the same* sequence of numbers as that which proceeds on rails to infinity. This point is parallel to the one made in Chapter 3, with the various indistinguishable conceptions of kind terms. In the same way that numbers accord with a rule, when the people involved in judging that the relevant features are reproduced agree, kind terms pick out the same sort of things in just those cases when the people involved judge the objects to be the same. Such relevant features are no different from privileged properties, because they are simply determined by what everyone *takes to be* the real properties of numbers or kinds that must be reproduced in order for people to agree that the rule has been followed.

The fact that certain properties are privileged is part of a particular problem situation, so under conceptual inevitability, which kind terms count as the best available will also factor into what the natural kinds are, in that problem situation. The problem that arises now is that there is nothing left to distinguish the kinds that are actually used from the world-three entities that are the natural kinds. Conceptual inevitability trivializes natural kinds so that any set of terms that people might use are the best that they could. An example used by Popper to illustrate the notion of a problem situation serves to make this point. He considers Galileo's theory of the tides, which by all accounts seems to overlook important information that should have been available to him. Popper shows that given his other commitments, it made the most sense to ignore the widely accepted influence of the moon on the tides and base his theory instead on the motion of the earth.<sup>73</sup> It is irrelevant what the world-one fact-of-the-matter is, whether "fish" really does include whales or not, or whether "cedar" or "*Thuja occidentalis*" cuts at nature's joints. If natural kinds are based on the best terms available in a world-three problem

<sup>&</sup>lt;sup>71</sup> Ibid, §143, 185, & 218-9.

<sup>&</sup>lt;sup>72</sup> Ibid, §225-8.

<sup>&</sup>lt;sup>73</sup> Popper (1972), 165.

# 5. Summary

I take the above to show one way in which the *inclusive* and *realist* components of inclusive realism are incompatible. Conceptual inevitability is not a viable option for Dupré's realism because it trivializes natural kind terms such that they are no longer distinguishable from any other kind terms. It makes the whole notion meaningless, which I take to be antithetical to the project of a natural kind realist. Further, I have shown that reference realism requires a Popperian world-one of objects and properties in themselves. In the next section, I suggest that the denial of real essences also precludes the possibility of conceiving of anything like world-one, real properties, or the objects themselves that Dupré references. In conjunction with the arguments against Boyd's *accommodationist* proposal, given in Chapter 3, I take this to establish the incompatibility of the *inclusive* and *realist* components of inclusive realism.

# C. Goodman's Worlds

For Goodman, there are not only three, but an innumerable proliferation of worlds each constituted by some coherent set of beliefs and relations between concepts. There is no analogy to Popper's world-one that serves to ground all other facts; instead, attempts to refer to such a world tie themselves in knots to no avail. The various worlds consists of various ways of describing, so statements are not compared with *the* world, but only with other statements.<sup>74</sup> In this picture, knowing subjects can hardly participate in a single world and will often change worlds mid-sentence. There is no question of primacy. The language endemic to each world is perfectly adequate to its task of describing distinct objects. In short, "actual worlds [are] made by and answering to true or right versions," where true or right versions simply means *coherent* versions.<sup>75</sup> In the remainder of this section I outline two of the ways of worldmaking that Goodman proposes, making comparisons with Dupré's pluralism. Then I show that Goodman's suggestion successfully does away with real essences, and it is at the expense of the possibility of a definitive realism about kinds, properties, or particular objects, establishing that reference realism is incompatible with a rejection of real essences.

<sup>&</sup>lt;sup>74</sup> Goodman (1978), 2-3.

<sup>&</sup>lt;sup>75</sup> Ibid, 94

# 1. Composition and Decomposition

Goodman enumerates five means of worldmaking: composition and decomposition, weighting of objects, ordering of objects, deletion and supplementation, and deformation.<sup>76</sup> I take the first two to be most relevant to his conception of truth. Composition and decomposition play a disproportionately important role in worldmaking, consisting of the production and application of labels<sup>77</sup> that might unify diverse things or further distinguish like ones. Goodman remarks that "[t]he response to the question 'Same or not the same?' must always be 'Same what?' …. Identity or constancy in a world is identity with respect to what is within that world as organized ….. A world may be unmanageably heterogeneous or unbearably monotonous according to how events are sorted into kinds."<sup>78</sup> Goodman shows that a consistent rejection of a privileged sameness relation results in identifying *versional* worlds, or coherent descriptions, with *objectual* worlds. Thus barring the possibility of references, like those made by Dupré, to the objects themselves as independent of the kind terms through which they are conceived.

Dupré rejects that there are real essences which can sort objects into their ultimately definitive kinds, but simultaneously holds that particular objects and their properties can be real. He even makes reference to the possibility that individual objects have real essences even if kinds do not.<sup>79</sup> However, Goodman raises the point that even accounting for what counts as the same object changes depending on what respect or property is considered as the same.<sup>80</sup> Furthermore, properties themselves are not clearly homogenous. One property instance can vary in significant ways from another and still accord with some rule which regards them as the same. It is not merely, for example, that what counts as red is vague, but that token instances of a single tone of red are only the same when the kind term "red" is composed such that it can be abstracted away from other properties, like spatiotemporal location or the color information surrounding it. In this way, the problem that concerns Dupré about natural kinds repeats itself with real properties. For some purposes—such as digitally editing an image—the property of being a certain shade of brown might belong to two different fields of pixels; however, for other purposes—such as drawing another person's attention to that pixel field—we might use the terms "orange" or "brown" depending on the contextualizing colors.<sup>81</sup> In this way, the same

<sup>&</sup>lt;sup>76</sup> Ibid, 7-16.

<sup>&</sup>lt;sup>77</sup> Labels are "names, predicates, pictures, etc." (Ibid, 8).

<sup>&</sup>lt;sup>78</sup> Ibid, 8-9.

<sup>79</sup> Dupré (1993), 64.

<sup>&</sup>lt;sup>80</sup> Goodman (1978), 94-5.

<sup>&</sup>lt;sup>81</sup> See the work of Beau Lotto at www.labofmisfits.com for many more such examples involving property illusions.

concerns that lead to pluralism about kinds have resulted in a pluralism about properties that refutes reference realism. Without knowing which properties are *real* rather than just *privileged*, there is no way to talk about objects themselves, their real properties, or *the* world at all.

# 2. Weighting of Objects

I take the next most relevant means of worldmaking to be the weighting of objects. Here, Goodman offers the term *relevant* kind as a replacement for *natural* kind, in order to emphasize how a particular world-version privileges some descriptions over others based on the extent that they play a role in that world. It is not that some kinds carve at the joints better than others, only that some kinds are simply irrelevant to certain projects. "In one world there may be many kinds serving different purposes; but conflicting purposes may make for irreconcilable accents and contrasting worlds, as may conflicting conceptions of what kinds serve a given purpose."<sup>82</sup> If one were to read Dupré into it, in such circumstances where kinds are at cross-purposes, the contrasting worlds harbor mutually exclusive *relevant* kinds. The relevance of kind terms to some purpose can be exclusive, and no particular purpose has priority. Weighting kind terms functions to emphasize them, in compatible worlds, as relevant or irrelevant to the purpose of inquiry for which the world is adjusted. If Dupré cannot be a realist about natural kinds, because reference realism entails a commitment to the real essences of kinds, then based on his pluralism, he is better off adopting the term *relevant* kinds.

## 3. World Versions and Locke

For Goodman, a world version is true when it is internally coherent and not in conflict with any "unyielding beliefs."<sup>83</sup> This implies that two individuals with particularly stubborn beliefs that result in very different world versions can make claims contradictory to each other and both be telling the truth. He goes so far as to assert that "[a scientist] as much decrees as discovers the laws he sets forth, as much designs as discerns the patterns he delineates."<sup>84</sup> However, in a tone that resonates with Dupré's arguments, he holds that the fact that there are many worlds does not imply that they are equally suited to every, or any, purpose.<sup>85</sup>

<sup>82</sup> Goodman (1978), 11.

<sup>&</sup>lt;sup>83</sup> Ibid, 17.

<sup>&</sup>lt;sup>84</sup> Ibid, 18-20.

<sup>&</sup>lt;sup>85</sup> Ibid, 123.

Goodman's radical pluralism is a direct result of the rejection of real essences which can be read in conjunction with the Lockean circle, which proceeds nominal essence—abstract idea—list of particular examples, described in Chapter 1. Without a commitment to real essences, abstracting from a list of particular examples can yield any number of arbitrarily varied abstract ideas. A series of examples of green objects could equally serve to form the abstract idea of green or grue,<sup>86</sup> the same gesture and utterance ("*gavagai*") might indicate an undetached rabbit part or a temporal segment of a rabbit just as much as it could indicate a rabbit.<sup>87</sup> Induction requires the assumption that some abstract ideas are more relevant or entrenched than others,<sup>88</sup> but without real essences to make recourse to, that assumption can never be adequately justified so as to support a definitive metaphysical thesis about the actual state-of-affairs. Instead, there is only a proliferation of various pictures of how the world might be, innumerable world versions and no clue as to whether there is a single world with which some God's-eye-view of it all might compare them.

The contrast seems no different than it did in Locke. The postulation of some abstract idea is formed from a list of examples; any abstract idea might be taken to be a privileged property and used to compose the nominal essence of a theoretical kind term. On the other hand, the mind-independent existence of some real essence, consisting of real properties, constitutes a real object. Since real essences and real properties are unknown, it is indiscernible whether the sameness relation used to create an abstract idea conform to them or not. This is another ambiguity of epistemic access as described in Chapter 3; when the fact-of-the-matter is unknown, it is impossible to choose between pictures which make the same predictions. The only way to get around this situation is to be able to compare the theory in question with the mind-independent, fact-of-the-matter, world-one truth. I take Goodman's suggestion to be that habit is what pushes certain relevant kinds to become entrenched and thus projectible in theoretical contexts.<sup>89</sup> Furthermore, world versions become true or right by not conflicting with these habits or other, better established and otherwise contingently favored world version.<sup>90</sup>

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 $<sup>^{86}</sup>$  Grue is an imaginary color term meaning "examined before a given date and

green, or not so examined and blue" (Ibid, 10).

<sup>&</sup>lt;sup>87</sup> Quine (1968), 188.

<sup>&</sup>lt;sup>88</sup> Goodman (1978), 10.

<sup>&</sup>lt;sup>89</sup> Ibid, 128, 130.

<sup>&</sup>lt;sup>90</sup> Ibid, 130-2.

<sup>&</sup>lt;sup>91</sup> Ibid, 94.

Dupré's reply might be that it "is not that there are no natural divisions to be found between kinds or organisms. Rather, there are too many."<sup>92</sup> Those which are emphasized depend on our interests and goals. However, it becomes unclear in this picture whether the extension of a kind term can reasonably be regarded as real. When the real essences that underlie not only kinds, but also properties and objects, are called into question, something has to be done that can justifiably privilege real essences for at least *some* properties in order to talk about any objects at all. Without some real properties, there is no coherent sense of real, world-one objects in themselves. Therefore, reference realism also requires a commitment to real essences.

# D. Summary

I take the arguments in this chapter to establish that kind realism, understood as either conceptual inevitability or reference realism, ultimately rely on a commitment to real essences. Therefore, it seems like the promiscuous realist proposal has three options: it must either formulate a way in which the concerns that lead to kind pluralism do not also lead to property pluralism, or reject its *inclusive* component and accept real essences, or reject its *realist* component and accept that not only kinds, but property and object distinctions are minddependent. So unless there is a sense in which an inclusive realist can be a realist about natural kinds-which is not based on the accommodationist picture, conceptual inevitability, or reference realism—Dupré's claim that "nothing I have said, either about scientific kinds or about the kinds of ordinary language, suggests that these kinds are in any sense illusory or unreal"<sup>93</sup> is false.

The rejection of a real essences is a slippery slope to Goodmanian relativism, while the acceptance of a real essences is a slippery slope to natural kind essentialism. The latter point I take to be established by the considerations in Chapter 1 and the former point by the present chapter. This is what I call the slippery slope of the real, because only with a commitment to real essences can real properties and real objects be rationalized.

<sup>&</sup>lt;sup>92</sup> Dupre (2004), 80. <sup>93</sup> Ibid. 36.

# Conclusion

# 1. Summary

The distinction between nominal and real essences is just one way of expressing the epistemic state-of-affairs which prevents all but the most trivial of ontological claims. In Chapter 3, Boyd's optimistic attitude about the epistemic access condition was shown to be based on an unjustified (and possibly unjustifiable) tendency to take inferential successes as validation that a theory approximates mind-independent reality. It was shown that without already knowing the truth about real essences and real causal relations, it is impossible to discern whether a theory approximates them or is empirically adequate. I referred to this as an ambiguity of epistemic access. This can be seen in the situation with real and nominal essences as well. Without already knowing that, given a list of particular examples, the abstract idea used to form a nominal essence is picking out real, rather than privileged properties; therefore, there is no way of establishing whether a nominal essence approximates a real essence or is just useful for the purposes at hand. Further, I showed that because this ambiguity extends to include the notion of causation itself, that the accommodationist proposal cannot escape the accusation of circularity by recourse to underlying causal structures and deny the non-causal contribution of social and linguistic context. Therefore, I concluded that the accommodationist picture of kind realism had to be modified to align with either reference realism or conceptual inevitability.

In Chapter 2, I attempted to give two possible readings of promiscuous realism, one that took conceptual inevitability as a form of kind realism, and another formulated as reference realism. Then in Chapter 4, it was shown that both options resulted in an implicit commitment to real essences. Furthermore, a consistent rejection of real essences, as exemplified by Goodman, not only eliminates the possibility of kind realism, but of realism about properties or particular objects at all insofar as properties are themselves general terms with diverse instances. In this situation there are only habitually privileged properties and the purposes one might have for creating a world version.

I take Goodman's proposal to be correct to the extent that it recognizes that considering the privileged properties—which are used in composing and decomposing world versions—as real properties, is unjustifiable. However, in agreement with Dupré's categorical empiricism, I do

not agree that this definitively eliminates the possibility that there is a world that does in fact have real essences, real properties, real objects, and even real/natural kinds. Unfortunately, due to the ambiguity of epistemic access, there is no way of checking the privileged properties we actually use to compose nominal essences to see whether they are anything other than empirically adequate in a given circumstance unless we already know what the real properties and real essences are. The result is that the situation is fundamentally ambiguous in two ways: first, it is unclear whether there are real properties and real essences, and second, even if there are such things, it is unknowable whether or not our distinctions emphasize them. It is just as reasonable to conclude, perhaps as one who takes the route of conceptual inevitability might, that all properties are real properties; it is equally reasonable to conclude, like Goodman, that all properties are merely privileged properties. This situation indicates to me that the only conclusion to be drawn is simply that no conclusion can be drawn. This amounts to a position of metaphysical quietism.

# 2. Values

Dupré's suggestion, about science in general, is that "the only way it can ultimately be evaluated is in terms of whether it contributes to the thriving of the sentient beings in this universe."<sup>94</sup> This can be read in juxtaposition to the suggestion made by Goodman's, which evaluates world versions based on their contingent familiarity and success. Any decision as to the matter of which of two equally probable world versions one ought to adopt is underdetermined and will ultimately be made based on habit. World versions are not evaluated based on what is true but on what they can do.<sup>95</sup> I take these two suggestions to be parallel, even though Dupré emphasizes the thriving of sentient beings, and Goodman emphasizes habit, insofar as the notion that sentient beings should thrive is at its foundation a sort of familiar habit.

Nonetheless, I agree with Dupré that contributing to the thriving of sentient beings in the universe is a purpose worth pursuing, if only because everyone I know and love is one of those sentient beings. If purposes and habits play such a central role, then those factors should be the objects of great scrutiny. Dupré argues that an important part of subverting the political abuse of scientific kind terms is undermining the essentialist perspective that supports drawing

<sup>&</sup>lt;sup>94</sup> Dupré (1993), 264.
<sup>95</sup> Goodman (1978), 129.

inferences about individuals based on the kind terms used to describe them.<sup>96</sup> In my estimation, the fact that Dupré does not embrace an attitude of antirealism like that of Goodman, even though they share a rejection of real essences, makes an important point. Antirealism makes purposes and habits mostly arbitrary; it makes harming sentient beings just as inconsequential as benefitting them. The quietist perspective I am advocating, on the other hand, is perfectly compatible with the pragmatic emphasis of elected values. Nonetheless, it recognizes that any selection of values will face unclear situations, for example: does it benefit sentient beings to be neurologically altered to only feel happiness? Should we consider bacteria to be sentient? Etc. The answers to questions such as these will ultimately be the result of habitual tendencies, and only through living out the choices made out of habit can those habits be evaluated. Accepting that the metaphysical fact-of-the-matter is out of reach means that precisely because of the ambiguities of epistemic access, there is "no ignorance and no extinction of ignorance."<sup>97</sup> We cannot know the metaphysical fact-of-the-matter so there is only the habitual value choices we make and their consequences.

# 3. The Slippery Slope of the Real and Ambiguities of Epistemic Access

Consistent rejection of a privileged sameness relation opens up a route beyond metaphysics, and in doing so, becomes a metaphysical position of sorts. It calls into question the significance of true and false statements. Goodman gives the following example: "Consider, to begin with; the statements 'The sun always moves' and 'The sun never moves' which, though equally true, are at odds with each other."<sup>98</sup> In contrasting world versions, each with its own non-hierarchically related sameness relations, one or the other sentence is true. Perhaps if one were to ask of Goodman the metaphysical question of truth: "But which sentence is *really* true?" he could give two possible replies. First, as quoted above, both statements are true, thus embracing a true contradiction. Second, he could reply that *really* neither were true, denying the law of excluded middle. Either option denies an Aristotelian orthodoxy; however, much like in the situation of the liar paradox, ("this sentence is false") that same orthodoxy requires that when the metaphysical question of truth is turned into a metaphysical statement of truth, "sentence A is *really* true," that statement is either true or false.

<sup>96</sup> Dupré (1993), 253-4.

<sup>&</sup>lt;sup>97</sup> Tsultrim (1999).

<sup>98</sup> Goodman (1978), 2.

Some endorse such unorthodox responses as adequate replies to the metaphysical question of truth. One could reply that both statements were neither true nor false, or both true and false.<sup>99</sup> Metaphysical quietism is yet a further option, which reaches the bottom of the slippery slope of denying any commitment to real essences and finds yet another ambiguity of epistemic access: none of the above answers to the metaphysical question of truth are distinguishable, and only knowing the answer in advance can serve to justify a commitment to any of the three proposals.<sup>100</sup> From this vantage point, it is clear that the appropriate response to the first ambiguity of epistemic access, between approximately true and empirically adequate statements, is to acknowledge the impasse and accept it. There is nothing further to be known.

<sup>&</sup>lt;sup>99</sup> Notably, Priest (2016).

<sup>&</sup>lt;sup>100</sup> Metaphysical quietism might be understood as a position expressed in the Majjhima Nikaya §63 when Malunkyaputta ask ten questions concerning speculative metaphysics of the Buddha Shakyamuni. These questions go unanswered because any possible declaration "does not lead to disenchantment, to dispassion, to cessation, to peace, to direct knowledge, to enlightenment, to Nibbna." (Ñanamoli & Bodhi (2009), 536)

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