

Leibniz and Locke on Natural Kinds

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I

One of the more interesting topics debated by Leibniz and Locke and one that has received comparatively little critical commentary is the nature of essences and the classification of the natural world.¹ This topic, moreover, is of tremendous importance, occupying a position at the intersection of the metaphysics of individual beings, modality, epistemology, and philosophy of language. And, while it goes back to Plato, who wondered if we could cut nature at its joints, as Nicholas Jolley has pointed out, the debate between Leibniz and Locke has very clear similarities to the topic that has dominated the philosophy of language from the 1970s on: namely, the challenge mounted by Kripke, Kaplan, Putnam, and others against Russellian and Fregean descriptivist accounts of meaning. Yet, this topic is also, as Jolley writes, one of the “most elusive” in the debate between Leibniz and Locke.² The purpose of this paper is to examine in detail Leibniz’s critique of Locke’s distinction between real and nominal essences. In doing so, I hope to show certain virtues in Leibniz’s account of metaphysics and philosophy of language that usually escape notice.

While I wish to provide a general account of Leibniz’s disagreement with Locke, I also plan to focus on the nature of species and natural kinds. In my opinion, those who have treated this topic have not paid sufficient attention to Leibniz’s claims that “Essence is fundamentally nothing but the possibility of the thing under consideration” (A VI, vi, 293) and “essences are everlasting because they only concern

¹For some noteworthy works that have discussed this issue, see: Nicholas Jolley, “Leibniz and Locke on Essences,” in *Leibniz: Critical and Interpretive Essays*, Michael Hooker (ed.), Minneapolis: University of Minnesota Press, 1978, pp. 196-208; Jolley, *Leibniz and Locke: A Study of the New Essays on Human Understanding*, Oxford: Clarendon Press, 1984, pp. 145-61; Susanna Goodin, “Locke and Leibniz and the Debate over Species,” in *New Essays on the Rationalists*, Rocco Gennaro and Charles Huenemann (eds.), Oxford: Oxford University Press, 1999, pp. 163-76; and Jonathan Bennett, *Learning from Six Philosophers*, Oxford: Oxford University Press, 2001, vol. 2, ch. 26.

²Jolley 1984, 145.

possibilities.” (A VI, vi, 296)³ The view underlying these claims hearkens back to the distinction that Leibniz draws in his “Meditations on Knowledge, Truth, and Ideas” between nominal and real definitions, and it is an interesting project to tease out the parallels between nominal and real definitions and nominal and real essences. It is more important, however, to develop Leibniz’s idea that real essences concern possibilities insofar as they are part of a complete picture of a possible world (which is not true of a nominal essence). Indeed, I hope that this paper will succeed in pointing to a connection between Leibniz’s modal metaphysics, philosophical theology, and epistemology that has been overlooked.

II

Book III of the *Essay* is, of course, devoted to the philosophy of language, to the relation between words and world. And it is here that we see two crucial aspects of Locke’s metaphysics and epistemology: his anti-essentialism and his conceptualism.⁴

Although a distinction between real and nominal definitions can be traced back to Aristotle’s *Posterior Analytics*⁵ and runs through the history of philosophy to Leibniz’s 1684 essay, “Meditations on Knowledge, Truth, and Ideas” (A VI, iv, 589-90; AG 26), Locke speaks in the opening chapters of Book III of a distinction between real and nominal essence. His main goal in this part of the *Essay* is to undermine the traditional Aristotelian notion of essence. He writes, “*Essence* may be taken for the very being of any thing, whereby it is, what it is. And thus the real internal, but generally, in Substances, unknown constitution of things, whereon their discoverable qualities depend, may be called their *Essence*.”⁶ But, Locke continues,

³Leibniz references and abbreviations are the following: A = Gottfried Wilhelm Leibniz, *Smtliche Schriften und Briefe*, ed. Deutsche Akademie der Wissenschaften zu Berlin (Darmstadt, 1923 ff., Leipzig, 1938 ff., Berlin, 1950 ff.), followed by series, volume and page number; AG = G.W. Leibniz: *Philosophical Essays*, ed. and trans. Roger Ariew and Daniel Garber (Indianapolis: Hackett, 1989); GP = G.W. Leibniz: *Die philosophischen Schriften*, edited by C. I. Gerhardt (7 volumes. Berlin, 1875-90. Reprint. Hildesheim, 1965), followed by volume and page number; L = Gottfried Wilhelm Leibniz, *Philosophical Papers and Letters*, edited and translated by Leroy E. Loemker, (2nd edition, Dordrecht, 1969). Leibniz’s *New Essays on Human Understanding* is A VI, vi; I have used the translation of Peter Remnant and Jonathan Bennett (Cambridge: Cambridge University Press, 1981), whose edition follows the page numbers of the Akademie volume.

⁴For a helpful discussion of the Locke’s conceptualism, see Roger Woolhouse, *Locke’s Philosophy of Science and Knowledge* (New York: Barnes & Noble, 1971), chs. 5 & 6.

⁵*Post. Anal.* II.10 (see 93b28ff).

⁶Locke references will be to John Locke, *An Essay concerning Human Understanding*, ed. Peter H. Nidditch (Oxford: Clarendon Press, 1975); Bk. ch. sec. will be given in the text.

'Tis true, there is ordinarily supposed a real Constitution of the sorts of Things; and 'tis past doubt, there must be some real Constitution, on which any Collection of simple *Ideas* co-existing, must depend. But it being evident, that Things are ranked under Names into sorts or *Species*, only as they agree to certain abstract *Ideas*, to which we have annexed those Names, the *Essence* of each *Genus*, or Sort, comes to be nothing but that abstract *Idea*, which the General, or *Sortal* (if I may have leave so to call it from *Sort*, as I do *General* from *Genus*.) Name stands for. And this we shall find to be that which the word *Essence* imports, in its most familiar use. These two sorts of *Essences*, I suppose, may not unfitly be termed, the one the *Real*, the other *Nominal Essence*. (III.iii.15)

In other words, each individual has a real, inner constitution that is the cause of its sensible properties. But when we classify individuals we sort them according to certain abstract ideas. When I encounter an individual x , I say “ x is F”, “ x is G” and so on, where F and G are simply abstract terms. Two sections later, Locke presents a well-known contrast that clarifies the matter rather nicely:

Concerning the real Essences of corporeal Substances, (to mention these only,) there are, if I mistake not, two Opinions. The one is of those, who using the word *Essence*, for they know not what, suppose a certain number of those Essences, according to which, all natural things are made, and wherein they do exactly every one of them partake, and so become of this or that *Species*. The other, and more rational Opinion, is of those, who look on all natural Things to have a real, but unknown Constitution of their insensible Parts, from which flow those sensible Qualities, which serve us to distinguish them one from another, according as we have Occasion to rank them into sorts, under common denominations. (III.iii.17)

The first, and less rational opinion, is clearly Aristotelian, the object of Locke's scorn. On the other hand, the more rational opinion that Locke advocates seems to be straightforward. Suppose I see Fido and Rover. Both Fido and Rover have distinct inner constitutions (real essences), and from their insensible parts flow certain sensible qualities, which I use to classify them. Thus, Fido and Rover are between mice and horses in size, hairy, four-legged, capable of barking, and so on. This set of sensible properties I group under one heading — the nominal essence — Dog, and I can also say, “Fido is a dog.” As we shall see in a moment, in Lockean terms what we have done is annexed a general Name (Dog) to an abstract, complex idea (whatever is hairy, four-legged, capable of barking, and so on).

It is important to notice at this point, however, that, for Locke, although it is legitimate to talk about the real essence of an individual, it is the nominal essence that we use in science and everyday life. Indeed, Locke goes on to say the following about the uselessness of appeals to real essences:

The frequent Productions of Monsters, in all the Species of Animals, and of Changelings, and other strange Issues of humane Birth, carry with them difficulties, not possible to consist with this *Hypothesis*: Since it is as impossible, that two Things, partaking exactly of the same real *Essence*, should have different Properties, as that two Figures partaking of the same real *Essence* of a Circle, should have different Properties. But were there no other reason against it, yet the *supposition of Essences, that cannot be known*; and the making of them nevertheless to be that, which distinguishes the Species of Things, *is so wholly useless*, and unserviceable to any part of our Knowledge, that that alone were sufficient to make us lay it by; and content ourselves with such *Essences* of the Sorts or Species of Things, as come within the reach of our Knowledge: which, when seriously considered, will be found, as I have said, to be nothing else, but those abstract complex *Ideas*, to which we have annexed distinct general Names. (III.iii.17)

Locke actually has two slightly different arguments in this passage. First, there seems to be a strong argument: if the real essence of an individual determined its sensible properties, then two individuals with the same real essence should not differ (so much) in their sensible properties; “monsters” (offspring that are thought to be of the same real essence as their parents) are occasionally produced in nature; therefore, the real essence does not determine sensible properties. Now, monsters will come back to frighten us later, and we shall see then that Locke lets them loose in a completely different context. But it should be noticed that this argument is bad, and bad for one of two reasons: either he is guilty of amphiboly by using the Aristotelian notion of “real essence” in one premise and his own notion of “real essence” in the other or he equates the real essence of an individual with its constitution and thereby suggests that *all* of the properties are involved in the individual’s real essence. While this latter move might not trouble us when discussing some kinds of things (e.g., gold), it is clearly a different matter in the case of organisms. The second argument is that since we can never know the Aristotelian real essences of things we cannot use them as a means to classify things. According to Locke, in the case of individual substances, not only will the nominal essence and the real essence always be different, but the real essence will remain unknown — because it is determined by the *insensible* parts of

the substance. In other words, insofar as the underlying and internal constituents of things are themselves by nature insensible, they can never be known by or discovered to the human understanding.

In Book III, Chapter 6, Locke makes his most important claims regarding the classification of substances into species and genera. As we have already seen, Locke holds that all classification is done according to nominal essences. More exactly, Locke argues that the general names that we use for individual substances are *merely* words for different abstract, general Ideas. These abstract, general Ideas become, for Locke, our sortal concepts — the concepts into which we sort individuals, the concepts that play a role in our classification of the world. He writes,

The measure and boundary of each Sort, or *Species*, whereby it is constituted that particular Sort, and distinguished from others, is that we call its *Essence*, which *is* nothing but that *abstract* idea to which the name is annexed: So that every thing contained in that *Idea*, is essential to that Sort. This, though it be all the *Essence* of natural Substances, that we know, or by which we distinguish them into Sorts; yet I call it by a peculiar name, the *nominal Essence*, to distinguish it from the real Constitution of Substances, upon which depends this *nominal Essence*, and all the Properties of that Sort; which therefore, as has been said, may be called the *real Essence*: *v.g.* the *nominal Essence* of *Gold*, is that complex *Idea* the word *Gold* stands for, let it be, for instance, a Body yellow, of a certain weight, malleable, fusible, and fixed. But the *real Essence* is the constitution of the insensible parts of that Body, on which those Qualities, and all the other properties of *Gold* depend. How far these two are different, though they are both called *Essence*, is obvious at first sight to discover. (III.vi.2)

This position is of course very important for his general metaphysical view, for Locke uses it to cast doubt on whether the boundaries that are thought to exist in nature are really there or are simply mind-dependent. Indeed, Locke makes the following, simple but tendentious move: he argues that individuals are classified according to sortal terms, that these sortal terms are simply our abstract ideas, and that, *therefore*, there are no genuine divisions in nature. Consider the following:

That essence, in the ordinary use of the word, relates to sorts; and that it is considered in particular beings no farther than as they are ranked into sorts; appears from hence: That take but away the abstract ideas, by which we sort individuals, and rank them under common names, and then the thought of any thing essential to any of them instantly vanishes;

we have no notion of the one without the other; which plainly shows their relation. It is necessary for me to be as I am; God and nature has made me so: But there is nothing I have is essential to me. An Accident, or Disease, may very much alter my Colour, or Shape; a Fever, or Fall, may take away my Reason, my Memory, or both; and an Apoplexy leave neither Sense, nor Understanding, nor Life... None of these are essential to the one, or the other, or to any Individual whatsoever, till the Mind refers it to some Sort or *Species* of things; and then presently, according to the abstract *Idea* of that sort, something is found *essential*. (III.vi.4)

According to Locke, then, the traditional Aristotelian view that the distinctions between species and kinds in the natural world are to be attributed to underlying real essences is wrong. Rather, names of species, natural kinds, or sortal concepts are the results of our process of abstraction. And as abstract ideas are *our creations*, individuals cannot have anything *essential* to them except as they are referred to some sort.

At first, this seems to be a bad non-sequitur. If we fill out this argument, we will see it more clearly. Since all sortal terms are abstract ideas, and since all abstract ideas are mind-dependent, there are no mind-independent properties of individuals that are essential to them. But Locke has admitted that there are *real essences* underlying the *nominal essences*; that is, he has admitted that there are properties of individuals that are the real underlying properties of those individuals or, alternatively, that there is an inner constitution of a thing upon which its sensible properties depend. So, it would seem, he should not be able to assert in such a cavalier manner that there is nothing essential to a substance.

What he means, however, is something defensible. To say that I am essentially rational is to say that I, insofar as I am a human being, am rational. Or, to put it somewhat differently: x is essentially (an) S *qua* F.⁷ This argument can be seen in a subsequent section.

'Tis true, I have often mentioned a *real Essence*, distinct in Substances, from those abstract *Ideas* of them, which I call their *nominal Essence*. By this *real Essence*, I mean, the real constitution of any Thing, which is the foundation of all those Properties, that are combined in, and are constantly found to co-exist with the *nominal Essence*; that particular constitution, which every Thing has within it self, without any relation to any thing without it. But *Essence*, even in this sense, *relates to a Sort*,

⁷I use "S" for Sortal (or Species). This point is made by Bennett, *op. cit.*, p. 96.

and supposes a *Species*: For being that real Constitution, on which the properties depend, it necessarily supposes a sort of Things, Properties belonging only to *Species*, and not to Individuals... (III.vi.6)

Properties are essential to species, and they can only be imputed to individuals insofar as they are understood as belonging to a distinct species.⁸ As Ayers puts it, for Locke, real essences are always determined relative to nominal essences.⁹ Thus, when Locke states flatly that “there is nothing I have is essential to me,” he means that, unless I am to specify what kind of being I am, any one of my attributes could be taken away.

Locke presents a further battery of arguments against the idea that species or kinds are distinguished according to some internal and natural essence or form. He claims that if that were so, then (a) we would have to know that “Nature, in the production of Things, always designs them to partake of certain regulated established *Essences*, which are to be the Models of all Things to be produced;” (b) we would have to know that nature *always* attains the essence it designs; (c) we would have to determine if *Monsters* were distinct species; (d) we ought to be able to know the real essences of those things that are claimed to be species; and (e) we ought to distinguish individuals into species according to perfect complex ideas of the properties of things (but we cannot do this). (III.vi.14-19) According to Locke, it is the human ability to form abstract general ideas based upon similarities in the sensible qualities of various individuals that enables us “see” the distinctions between species and natural kinds in the world. One argument in particular recalls his rejection of innate ideas: he claims that ignorant and barbarous peoples, who never had any of the benefit of scientific understanding, sort and classify individual substance according to outward appearances; and we do the same thing.¹⁰ (III.vi.25)

There is one last epistemological and semantic argument that Locke raises, one that Leibniz picks up on and one that will be of some interest to us. Locke writes,

⁸Locke is using a traditional Aristotelian notion of property, according to which properties are essential to a thing and follow from its specific difference (e.g. in “rational animal”, “animal” is the genus, “rationality” is the difference, “rational animal” is the species man, and the “properties” are related to rationality) and differ from mere accidents which are not essential to an individual. (See Michael Ayers, *Locke: Epistemology & Ontology*, 2 vols., London: Routledge, 1991. Vol. II, pp. 18ff.)

⁹Ayers, *op. cit.*, p. 74.

¹⁰Not only does anthropology furnish such an argument, so does history. We need only point to the fact that our natural kind and species terms have a fairly long history of usefulness, that so many of these terms have become “entrenched” (to use Nelson Goodman’s phrase), and that our predecessors’ ways of “dividing reality” (to Eli Hirsch’s phrase) clearly depended upon sensible properties.

Since then it is evident, that we sort and name Substances by their *nominal*, and not by their real *Essences*, the next thing to be considered is, how, and by whom these *Essences* come to be made. As to the latter, 'tis evident they are *made by the Mind*, and not by Nature: For were they Nature's Workmanship, they could not be so various and different in several Men, as experience tells us they are. For if we will examine it, we shall not find the nominal Essence of any one *Species* of substances, in all Men the same; no not of that, which of all others we are the most intimately acquainted with. It could not possibly be, that the abstract *Idea* to which the name *Man* is given, should be different in several Men, if it were of nature's making; and that to one it should be *Animal rationale*, and to another, *Animal implume bipes latis unguibus*. (III.vi.26)

Why should this point matter? It speaks to the fact that different people may attach different meanings to the same term. According to Locke, if nature were open and the real essences of things discoverable, then there ought to be uniformity in the meanings that human beings attach to natural kind terms. As there is no uniformity in the meanings of natural kind terms, we do not have access to the real essences of things. As Leibniz will show, there is something deeply unsatisfying about Locke's argument on this point.

All of this goes to show, for Locke, the primacy of nominal essences and the near worthlessness of Aristotelian real essences in our classificatory system(s). But Locke has a more radical point that only sometimes makes itself apparent: it is not only that species and natural kinds are *not* determined by real essences, it is that there may be no real divisions in nature at all. As Michael Ayers has argued, Locke's view of classification is dependent not only on his epistemology but also on his ontology.¹¹ In Locke's mechanism, the difference between objects is a matter of degree of the mechanical components of that thing. Indeed, the differences are on some kind of continuum, so that there are no clear material and mechanical differences between objects. Consider the following, in which Locke is discussing the "Great Chain of Being":

It is not impossible to conceive, nor repugnant to reason, that there may be many *Species of Spirits*, as much separated and diversified one from another by distinct Properties, whereof we have no *Ideas*, as the *Species* of sensible Things are distinguished one from another, by Qualities which we know, and observe in them. That there should be more *Species* of

¹¹Ayers, *op. cit.*, vol. II, ch. 6; see also his "Locke versus Aristotle on Natural Kinds," *Journal of Philosophy* 78:5 (1981), 247-72 (this point is on p. 255).

intelligent Creatures above us, than there are of sensible and material below us, is probable to me from hence; That ***in all the visible corporeal world, we see no Chasms, or Gaps.*** All quite down from us, the descent is by easy steps, and a continued series of Things, that in each remove differ very little one from the other. There are Fishes that have Wings, and are not Strangers to the airy Region: and there are some Birds, that are Inhabitants of the Water; whose Blood is cold as Fishes... There are Animals so near of kin both to Birds and Beasts, that they are in the middle between both... There are some Brutes, that seem to have as much Knowledge and Reason, as some that are called Men: and the Animal and Vegetable Kingdoms, are so nearly join'd, that if you will take the lowest of one, and the highest of the other, there will scarce be perceived any great difference between them; and so on, till we come to the lowest and the most inorganic parts of Matter, we shall find every-where, that the several *Species* are linked together, and differ but in almost insensible degrees. And when we consider the infinite Power and Wisdom of the Maker, we have reason to think, that it is suitable to the magnificent Harmony of the Universe, and the great Design and infinite Goodness of the Architect, that the *Species* of Creatures should also, by gentle degrees, ascend upward from us toward his infinite Perfection, as we see they gradually descend from us downwards... (III.vi.12; my emphasis in bold)

Locke's claim that we see no "chasms or gaps" in nature is remarkable. It could mean one of two things: either all individuals are arrayed in a kind of continuum (which would seem to be a consequence of his mechanism) or all species are arrayed in a kind of continuum (which does seem to be what he is saying here). If the former is the case, then there would seem to be no species at all; if the latter is the case — which is most likely Locke's view and which might seem more palatable — then all the possible species in logical space are exhausted by the present world. Either way, as we shall see, Leibniz will object.

As part of Locke's assault on the Aristotelian notion of essence, he also adduces arguments against a very sensible aspect of traditional thought in natural philosophy: that species membership is related to an individual's generation or causal history. At one point, Locke, the trained physician, claims that he "once saw a Creature, that was the Issue of a Cat and a Rat, and had the plain Marks of both about it." (III.vi.23) Ironically, we find this incredible claim in the same section in which Locke tries to score what would otherwise be an important philosophical point: "if the *Species* of Animals and Plants are to be distinguished only by propagation, must I

go to the *Indies* to see the Sire and Dam of the one, and the Plant from which the Seed was gather'd that produced the other, to know whether this be a Tiger or that Tea?" Well, it might certainly have helped if Locke had observed the studding and birth of his *crat*. We shall come back to this issue in a moment.

Locke further claims that there are indeed great *resemblances* in nature and that many things may indeed appear to be kin to each other. But, as he is quick to assert, this still does not mean that the individuals are sorted or classified according to internal differences made by nature, that is, by real essences.

This then, in short, is the case: *Nature makes many particular Things, which do agree one with another, in many sensible Qualities, and probably too, in their internal frame and Constitution: But 'tis not this real Essence that distinguishes them into Species; 'tis Men, who, taking occasion from the Qualities they find united in them, and wherein, they observe often several individuals to agree, range them into Sorts, in order to their naming, for the convenience of comprehensive signs; under which individuals, according to their conformity to this or that abstract Idea, come to be ranked as under Ensigns; so that this is of the Blue, that the Red regiment; this is a Man, that a Drill: And in this, I think, consists the whole business of Genus and Species. ... I do not deny, but Nature, in the constant production of particular Beings, makes them not always new and various, but very much alike and of kin one to another: But I think it nevertheless true, that the boundaries of the Species whereby Men sort them, are made by Men; since the Essences of the Species, distinguished by different Names, are, as has been proved, of Man's making, and seldom adequate to the internal Nature of the Things they are taken from. So that we may truly say, such a manner of sorting of Things, is the Workmanship of Men. (III.vi.36-37)*

Again, we go from the claim that classification of individuals is done according to the conceptual division of men to a skepticism about whether or not there are genuine divisions in nature. Are there joints in nature? Locke claims only that the "internal frame and constitution" of things with similar sensible properties are *probably* similar. But since the internal frame and constitution of individual substance remain undiscovered to the human mind, they do not serve as the basis for classifying things into sorts and species.

A last point that bears the most resemblance to contemporary discussions of natural kind terms and essence. In one of the final sections of this chapter, Locke writes the following:

[L]et us consider, when we affirm, that all *Gold* is fixed, either it means that Fixedness is a part of the Definition, part of the nominal Essence the Word *Gold* stands for; and so this Affirmation, *all Gold is fixed*, contains nothing but the signification of the Term *Gold*. Or else it means, that Fixedness not being a part of the definition of the Word *Gold*, is a Property of that Substance it self: in which case, it is plain, that the Word *Gold* stands in the place of a Substance, having the real Essence of a Species of Things, made by nature. In which way of Substitution, it has so confused and uncertain a signification, that though this Proposition, *Gold is fixed*, be in that sense an Affirmation of something real; yet 'tis a Truth will always fail us in its particular Application, and so is of no real Use nor Certainty. For let it be ever so true, that all *Gold*, i.e. all that has the real Essence of *Gold*, is fixed, What serves this for, whilst we know not in this sense what is or is not *Gold*? For if we know not the real Essence of *Gold*, 'tis impossible we should know what parcel of Matter has that Essence, and so whether it be true *Gold* or no. (III.vi.50)

What Locke has in mind here is this. The nominal definition of “Gold” is, as we have seen, the set of sensible properties that we list under this term; as “fixedness” is just among those properties, the assertion that “all gold is fixed” is simply a case of marking one of the properties of its nominal essence. We are not, as it were, saying anything new about gold. On the other hand, one could say that “gold” means that substance that has a certain real essence. But now Locke’s critique: even if this is the case, we will still never be able to say that *this thing here* is gold unless we appeal to its sensible qualities, that is, unless we say that *this* falls into the species that we designate as having a certain nominal essence. But Locke is making a point about the semantics of natural kind terms: the meaning of “gold” depends upon our descriptions of it, and the possibility of referring to something as “gold” and reflecting upon truths about its nature is dependent upon those descriptions.¹²

The claims of Book III, however, are all in service of the skeptical arguments of Book IV. With regard to the nature of species and natural kinds, Locke’s point is simply that we cannot make knowledge claims about them. More particularly, Locke argues that we can only have certain knowledge when the bounds of species terms in propositions are known. And, although the real and nominal essences of simple

¹²Two points here. First, this is simply a different way of putting Ayers’s point that real essence is relative to nominal essence. Second, this passage does not seem to harmonize well with the argument mentioned above that, because people do not always attach the same descriptions (meanings) to natural kind terms, we are justified in claiming that we do not have access to the real essences of individuals.

ideas are the same and hence knowable, in the case of substances and species they differ and are therefore unknowable. (IV.vi.4) Therefore, according to Locke, “*The Names of Substances then, whenever made to stand for Species, which are supposed to be constituted by real Essences, which we know not, are not capable to convey Certainty to the Understanding.*” (IV.vi.5) Leibniz will have none of this stronger view, arguing that there are in fact many things that we can know about the essence of natural kinds. But with that, let us turn to Leibniz.

III

Leibniz shares Locke’s anti-realist tendencies, but that may be the extent of their agreement. Whereas Locke was skeptical about the notion of real essences of substances, one of Leibniz’s most fundamental views was that each individual substance indeed had an essence. Of course, that in itself does not mean much, for the Leibnizian world is a world of individuals, each with its own essence; this does not necessarily mean that there are essences of natural kinds or genera and species; nor is Leibniz committed to the view that these essences are known to us. But Leibniz advances, I think, a rather subtle view about the nature of species and natural kinds, a view that has not received the attention it deserves. (Or rather, one encounters explications of Leibniz’s general view on modal metaphysics and epistemology, but its relevance to topics in semantics and the nature of kind terms is seldom emphasized. This paper is an attempt to correct that.) As Jolley points out, Locke’s *Essay* clearly frustrates and baffles Leibniz at times. And while Leibniz is willing to play along with Locke’s distinction between real and nominal essences, he does so only up to a point.

Consider Leibniz’s first encounter with this distinction in the *New Essays*:

It seems to me that your way of putting things constitutes a very novel mode of expression. People have certainly spoken of ‘nominal’ definitions and ‘causal’ or ‘real’ ones, but so far as I know they have not until now spoken of essences other than real ones, unless a ‘nominal essence’ is understood to be a false and impossible one — something that appeared to be one but really is not — as that of a regular decahedron, a regular solid bounded by ten planes or surfaces, would be. *Essence is fundamentally nothing but the possibility of the thing under consideration.* Something which is thought possible is expressed by a definition; but if this definition does not at the same time express this possibility then it is merely nominal, since in this case we can wonder whether the definition expresses anything real — that is, possible — until experience comes to our aid

by acquainting us a posteriori with the reality (when the thing actually occurs in the world). This will do, when reason cannot acquaint us a priori with the reality of the thing defined by exhibiting its cause or the possibility of its being generated. So it is not within our discretion to put our ideas together as we see fit, unless the combination is justified either by reason, showing its possibility, or by experience, showing its actuality and hence its possibility. *To reinforce the distinction between essence and definition, bear in mind that although a thing has only one essence, this can be expressed by several definitions, just as the same structure or the same town can be represented by different drawings in perspective depending on the direction from which it is viewed.* (A VI, vi, 293-94; my emphasis)

It should be clear that Leibniz dislikes Locke's apparently misleading use of "essence". Theophilus's concluding point in this paragraph (a comment on III.iii.15) is that an individual can only have one essence, which is subject to distinct and varying definitions. (In this sense, according to Leibniz, Locke's point that different people attach different meanings to natural kind terms is irrelevant to the nature of and our possible knowledge of the real essences of things and kinds.)

But Leibniz's claim that "essence is fundamentally nothing but the possibility of the thing under consideration" is important and deserves further analysis. First, it ought to be connected with the whole constellation of his views on modality, including the nature of possible worlds, God's free choice of the best of all possible worlds, striving possibles, and so on. Now, this is a large topic, and I shall be brief: for Leibniz, each substance has a concept or notion "so complete that it is sufficient to contain and to allow us to deduce from it all the predicates of the subject to which this notion is attributed" (A VI, iv, 1540; AG 41); insofar as this concept is consistent with a set of other essences or concepts, then it is possible, or better, a member of a possible world. Of course, God freely chooses the best of all possible worlds, thereby actualizing the set of concepts that contains the greatest degree of perfection and happiness. But, of course, this set and all other sets remain in the divine understanding; and when Leibniz says "...essences are everlasting because they only concern possibilities" (A VI, vi, 296) he means that individual essences or complete individual concepts are consistent with other sets of essences of individuals and are within the infinite and eternal mind of God.

Second, Leibniz's view of real essence not only holds of individual substances but can also be applied to genera and species.¹³ As we saw above, Locke had claimed

¹³Susanna Goodin makes a similar point; see Goodin, *op. cit.*, pp. 172-73.

that there is a continuum of species above us and below us (i.e. more perfect, all the way up to God, and less perfect, all the way down to nothingness?). — “[I]n all the visible corporeal world,” Locke told us, “we see no Chasms, or Gaps.” (III.vi.12) — Leibniz, whose philosophy more than any one else’s is concerned with problems of the infinite, will have none of this. His reasoning on this matter is fascinating. He writes:

I shall say a word about the reason for the difference that exists here between the concepts of species [*notions des especes*] and those of individual substances with respect to the divine will rather than to simple understanding. This difference is that the most abstract concepts of species contain only necessary or eternal truths which do not at all depend on the decrees of God (although the Cartesians say they do, you yourself do not seem to be concerned about this point). But the concepts of individual substances, which are complete and suffice to distinguish their subjects completely, and which consequently enclose contingent truths or truths of fact, and individual circumstances of time, place, etc., must also enclose in their concept taken as possible, the free decrees of God, also viewed as possible, because these free decrees are the principal sources of existences or facts. Essences, on the other hand, are in the divine understanding prior to any consideration of the will. (G II 49; L 332)

Thus, essences are eternal insofar as they exist in the divine understanding, but they also represent necessary and eternal truths. What does it mean to say that the essences or concepts of species are necessary? One anachronistic — but I think correct — answer is to say that an essence of a species is accessible from any possible world and that an essence will be of the form *if x is an S , then x is F (and this will be true in all possible worlds)*.

The crucial point, however, is that, contrary to Locke’s picture, Leibniz does believe that there are gaps or chasms in nature. Genuine joints are opened up in the natural world because natural kinds are the results of the strivings of possible individual essences and God’s free choice of one world over others. For example, consider the following “individuals”:

A	B	C	D
yellow	yellow	yellow	yellow
malleable	malleable	malleable	brittle
heavy	heavy	heavy	heavy
structure x	structure x	structure x	structure x
dimensions a	dimensions b	dimensions c	dimensions d
W -member	W -member	W -member	W* -member

A, B, C, and D share some but not all properties. A, B, and C share the properties yellow, heavy, malleable, and being of a certain internal micro-structure; D, on the other hand, while yellow and heavy (and possessing the same micro-structure), is not a member of *this* world. Why? It's not correct to say that its set of properties is impossible; its set of properties is simply not consistent with other things in this world. Of course, it's not just individual D. For Leibniz, *nothing* that is yellow, heavy, and brittle (with an atomic number of 79) can exist in this world. In other words, gaps or chasms are opened up in nature when God, as it were, selects against other possible essences in his choice to create this possible world. The same thing must be true about the gaps and chasms in the living world.

Fido	Rover	Spot	Snoopy
four-legged	four-legged	four-legged	four-legged
hairy	hairy	hairy	hairy
able to bark	able to bark	able to bark	able to fly bi-plane
size x	size x	size x	size x
W -member	W -member	W -member	W* -member

The point is, of course, that some individuals will be grouped together with a certain complement of properties, and boundaries between species will arise in that way. Moreover, we should not forget the other part of Leibniz's argument: God could have chosen a world in which dogs* can fly airplanes or are scaly — those were possibilities — but He did not; therefore, within our world it is certain (or necessary *ex hypothesi*) that dogs are not scaly or able to fly me from Romania to Kentucky.

That there should be gaps and chasms in nature, forming the boundaries between species and natural kinds, seems to fit in nicely with Leibniz's modal metaphysics. Of course, one could ask whether this must be so. In other words, do all possible worlds have such gaps and chasms? Could God have created a world in which all species

and, indeed, all individuals are arrayed in some kind of continuum? On one level, the answer is quite simple: if any one world has boundaries between natural kinds and species, then all worlds have boundaries between natural kinds and species. But there is another reason why this could not be so — though this answer has less to do with modality and more to do with our (and Leibniz's) understanding of the living world. Species are defined in part at least in terms of their generation. Consider the following passage, in which Leibniz distinguishes more clearly than Locke does between, on the one hand, physical objects (pieces of gold, silver, and so on) and, on the other, plants and animals:

But when men settle on physical species, they do not abide by such rigorous standards; and it is for them to say whether stuff which they themselves are able to restore to its previous form continues to be of the same 'species' so far as they are concerned. And so we say that water, gold, quicksilver, and common salt remain such, and are merely disguised, in the ordinary changes they undergo; *but in the case of organic bodies - i.e. the species of plants and animals — we define species by generation, so that two similar individuals belong to the same species if they did or could have come from the same origin or seed.* In the case of man we demand not only human generation but also the quality of being a rational animal; and although some men remain like beasts all their lives, we presume that that is not for want of the faculty, i.e. of the fundamental capacity, but rather because of impediments which hold it back. But we have not yet settled exactly what outer facts we are willing to take as sufficient to create this presumption. *However, no matter what rules men make to govern how things are to be named and what entitlements go with names, provided that the system of rules is orderly (i.e. interconnected and intelligible) it will be founded in reality, and men will be able to imagine only such species as have already been made or distinguished by nature — nature which even encompasses possibilities.* As for what is inner: although every outer appearance is grounded in the inner constitution, it can nevertheless happen that two different constitutions result in the same appearance; yet there will be something in common, and that is what philosophers call the 'immediate formal cause'. ... (A VI, vi, 309; my emphasis)

As we have seen, Locke was somewhat critical of appeals to generation in classifying individuals; he suggested that he didn't need to go to India to see the sire and dame of a particular big, orange and black-striped, feline to say that it was a *tiger*. But,

for Leibniz, the causal history of a being really is part and parcel of the essence of an individual, and a classification can only be *true* if the individual has the “right” history. Ultimately, in Leibniz’s view, “the more deeply we study how species are generated, and the more thoroughly our rankings follow the necessary conditions of generation, the nearer we shall come to the natural order.” (A VI, vi, 310) In other words, there are foundations of distinct species in reality *and* they make the further generation of individuals within a species possible. Although Leibniz does not bring the point out here, this is another sense in which essence is tied in with possibility.

Not only does Leibniz disagree with Locke about the gaps and chasms that are in the world, his more fundamental disagreement with Locke concerns our knowledge of the essences of natural kinds and species. Shortly after the passage in which Leibniz claims that “essence is fundamentally nothing but the possibility of the thing under consideration,” Leibniz goes on to make this important argument.

I would sooner say, in keeping with accepted usage, that the essence of gold is what constitutes it and gives it the sensible qualities which let us recognize it and which make its nominal definition; whereas if we could explain this structure or inner constitution we would possess the real, causal definition. However, *in our present case the nominal definition is also real, not in itself* (since it does not show us a priori the possibility of this body, and its mode of origin) *but through experience, in that we find that there is a body in which these qualities occur together.* Otherwise we could doubt whether such a weight was compatible with so much malleability, just as we can still wonder whether glass which is malleable when cool is naturally possible. *Nor do I agree, sir, with your view that in respect of this matter ideas of substances differ from ideas of predicates; that definitions of predicates (i.e. of modes and of objects of simple ideas) are always nominal and real at once, while those of substances are only nominal.* I do agree that it is more difficult to have real definitions of bodies, which are substantial entities, because their structure is less sensible. But the same is not true of all substances: we have as intimate a knowledge of true substances or unities, like God and the soul, as we have of most modes. Besides, some predicates are no better known than is the structure of bodies: yellow and bitter, for instance, are objects of simple ideas or imaginings, and nevertheless we have only a confused knowledge of them; even in mathematics a single mode can have a nominal as well as a real definition. Not many people have properly explained the difference between these two definitions, a difference which also marks off essence from property. In my opinion,

the difference is that the real definition displays the possibility of the definiendum and the nominal does not. (A VI, vi, 294-95; my emphasis)

There are a number of points that deserve comment here. First, Leibniz seems to be arguing that, although the real definition of something contains the grounds of its possibility, we can say that a nominal definition is *real* when experience shows its possibility. Thus, we have no *a priori* grounds to hold that the definition of gold as something yellow, heavy, malleable and so on is possible, but experience shows us that this collection of qualities is compossible. Second, Leibniz rejects Locke's claim that we can have knowledge of simple modes (and the causes of simple ideas) and not of substances. For, according to Leibniz, even those ideas that Locke takes to be simple are, in fact, often confused; whereas we can make many certain assertions about particular substances. Third, Leibniz claims that we ought to follow common practice and say that gold has a certain essence that simply is its inner constitution and that causes its sensible properties. While this seems like Locke's position (with the exception that Locke speaks of nominal and real essences when Leibniz would prefer to speak of essence and nominal and real definitions), Leibniz has something very un-Lockean in mind: namely, that we can in fact know some things about the real essence of gold — about its possibility and so on — by virtue of what we know about gold by experience. More particularly, we can know through experience that certain properties are compossible: in the case of gold, for example, the properties of a certain weight and malleability. Whereas Locke had claimed that our classifications (our sortal concepts) are simply the workmanship of the human mind and need not correspond to *actual* divisions or joints in the world, Leibniz seems clearly to be endorsing the contrary claim that, as we gather more and more empirical evidence, our natural kind and species terms really do refer to bounded groups in the world.

It is also important to realize that Leibniz does not rule out the possibility of our coming to know the “inner” constitutions of things or of finding some distinct set of properties that mark out a given species.

And if we had the acuity of some of the higher Spirits, and knew things well enough, perhaps we would find for each species a fixed set of attributes which were common to all the individuals of that species and which a single living organism always retained no matter what changes or metamorphoses it might go through. (Reason is a fixed attribute of this kind, associated with the best-known physical species, namely that of humans; reason belongs inalienably to each individual member of the species, although one cannot always be aware of it.) But lacking such knowledge, we avail ourselves of the attributes which appear to us the

most convenient for distinguishing and comparing things and, in short, for recognizing species or sorts; and those attributes always have their foundation in reality. (A VI, vi, 310)

At the moment, according to Leibniz, we do not seem to have such knowledge of what for Locke are the real essences of things, and so we content ourselves with the sensible properties. But even here Leibniz seems less skeptical than Locke, for he allows that the features that we use to classify individuals into species do in fact have their foundation in reality. More to the point, Leibniz claims that there are certain *fixed* attributes for species, which really do determine membership in a species or a natural kind. For human beings, it is rationality; and, I suspect, had Leibniz lived long enough to study our chemical theories and read Kripke, he might also have claimed that water has a fixed attribute related to its constitution by hydrogen and oxygen atoms.

These arguments about the possibility of our knowledge of essences underlie a moral concern of the *New Essays*. As Jolley has argued, the argument between Leibniz and Locke on real and nominal essences ought to be seen as being an argument about the nature of human beings, in which Leibniz wishes to defend the traditional view that human beings are *essentially* distinct from other living beings by virtue of their rationality (and by extension their capacity of ethical thought). I think that this is right, to a point. Not only does Leibniz rehearse the standard view that man is essentially rational, his claim is that this is something *inner* and hence *real*. He writes, “In the case of man, I believe that we have a definition which is at once nominal and real. For reason is as internal to man as anything can be, and ordinarily it declares its presence.” (A VI, vi, 314) Moreover, there are some unwelcome consequences to Locke’s view that sortal concepts are *purely* the work of the human mind. Indeed, if we agree with Locke’s point that species or sorts are merely determined by our rankings according to different sensible qualities, Leibniz says that we would then be justified in marking out different species among humankind.

[T]here is no likelihood that a spaniel and an elephant come from a single ancestral line or that they have any such specific nature in common. So, when we talk about the different sorts of dogs in terms of appearances, we can distinguish their species, and when we talk in terms of inner essences we can remain uncertain; but when we compare a dog and an elephant we have no grounds for attributing to them, externally or internally, anything which would make us believe that they belonged to a single species. And so we have no grounds for hesitating to reject such a presumption. We could also distinguish species, logically speaking, among men; and if

we laid stress on externals we should also find differences which, physically speaking, could count as specific. Thus there was an explorer who believed that Negroes, Chinese and American Indians had no ancestry in common with one another or with peoples resembling ourselves. But as we know the inner essence of man, namely reason, which resides in the individual man and is present in all men, and as we find among us no fixed inner feature which generates a subdivision, we have no grounds for thinking that the truth about their inner natures implies that there is any essential specific difference among men. (A VI, vi, 325-26)

In other words, according to Leibniz, there is a *real* difference between the spaniel and the elephant, a difference not only in their appearances but also in their natures. Moreover, the spaniel and the elephant could never have come from the same ancestor, which is not the case with a spaniel and a beagle. Similarly, if one were to concern oneself solely with sensible qualities, one might be tempted to say that the different ethnic groups mentioned by Leibniz are distinct species. But, for Leibniz, members of these groups are all really members of the same species; not only do they all have (or could have) the same causal history, they all have the same fixed attribute: reason.¹⁴

On the other hand, we should not be too moved by this part of Leibniz's argument (and Jolley's interpretation). For if the view that I sketched above is correct, then we are justified in saying that there are species in other possible worlds that are rational. It is a certain (unique) *set* of properties that distinguishes human beings from other beings in this world and from other-worldly human-like (rational) beings.¹⁵ It may be that Leibniz follows tradition in holding rationality to be the specific difference for human beings in this world. But it would seem that, on Leibniz's principles, there are any number of human properties that distinguish humans-in-the-best-possible-world from human-like beings in other possible worlds.

Let us return to the more obvious epistemological dispute. As we have seen, part of Locke's concern is to resolve problems that he claims were associated with an

¹⁴Incidentally, according to Leibniz, "a female can give birth to an animal which seems to belong to another species, this irregularity being caused simply by the mother's imagination - not to mention 'mola', as it is called." (A VI, vi, 315) 'Mola' was a growth in the womb. So, of course, the woman delivers a handicapped baby, and it's her fault! Just for having the wrong thoughts while pregnant.)

¹⁵We might be able to say that a human being is essentially a being with a certain genome, as we claim that water is H_2O . But it would be wrong to hang everything on rationality. That is, given the rest of his theory, Leibniz should tie essence to some unique inner structure (as contemporary essentialists are wont to do) and abandon the traditional privileging of rationality: which is presumably not unique to humans (in all possible worlds).

abuse of words. With regard to “essence”, Locke argues that we ought to confess that “essence” is really just a word that we use to describe “nominal essence”, a set of sortal concepts based upon sensible qualities; we ought not to act as if “essence” means anything about the real or inner constitution of a thing, for we will remain ignorant of that. Leibniz, however, holds that we can know certain things not only about individuals but also about their species and genera. In Book IV of the *New Essays*, in which Philalethes gives his critique of the possibility of our certain knowledge about substances *qua* natural kinds, Theophilus says, “[L]et me tell you that there are, for example, hundreds of truths that we can be certain of concerning gold, i.e. that body whose inner essence reveals itself through the greatest weight known here on earth, or through the greatest ductility or by other marks. For we can say that the body with the greatest known ductility is also the heaviest of all known bodies.” (A VI, vi, 400) For our purposes, the interesting questions to ask are: What is it that we can really know about gold? And how do we know it? It is here that we must recall Leibniz’s claim that essence is nothing but the possibility of a thing. I take it that Leibniz has something like the following argument in mind: experience informs us of a certain consistent set of sensible properties in, for example, gold; that is, a certain set of properties is *compossible*. And, as I said above, it would seem that, according to Leibniz, we can come to know the following: (1) *if x is an S, then x is F*, or (2) *if x is F & G & ... , then x is H*. Notice, however, that (2) avoids an obvious problem associated with (1), a problem that Locke himself touched on: namely, how does one know when any “parcel of matter” is really an S?¹⁶

IV

As we have seen, the disagreement between Leibniz and Locke about essences touches on many important issues. Locke’s view was that we accomplish all of our classification by means of nominal essences (sets of sensible qualities that should follow from the inner constitutions of things), and Aristotelian real essences are useless. Indeed, he even makes the epistemological claim that, since, in the case of substances, the nominal essence must differ from the real essence (the inner constitution of things), we cannot have certain knowledge about the nature of substances and natural kinds. At the level of semantics, it should be clear that, on Locke’s account, the meaning of natural kind terms (or sortal concepts) is determined by the set of descriptions of those sensible properties of individuals. More interesting, from my point of view

¹⁶I believe that we sometimes slide easily from “What does ‘gold’ mean?” to “What is gold?” But the hard question that Locke raises, and that Leibniz doesn’t really answer, is this: “How do I know that *this* is gold?”

however, is Locke's belief that in all of sensible nature there are no genuine "chasms or gaps." Not only does a weak sense of this claim follow from his epistemology — we cannot observe any chasms or gaps in nature — but a much stronger sense follows from his mechanistic ontology: because individuals differ only by degree in their internal constitutions, *there really are no chasms or gaps in nature*. All possible natural kinds and species are actual (or have been or will be).

It is clear that Leibniz's disagreements with Locke are deep. For Leibniz, there can be said to be real divisions in nature; nature does have joints at which we can carve up the world. What is most interesting is that Leibniz's view of the jointedness of nature is a consequence of his modal metaphysics. Here gaps or chasms are opened up in logical space because some essences belong to other possible worlds that turn out to be inferior to the actual world. Whereas Jolley is right to claim Leibniz's concern is to defend the traditional picture of the distinct nature of man against Locke's radicalism, it is also the case that Leibniz's view is a consequence of the orthodox view of God as free creator of the world *and* the very Leibnizian view of theodicy, that God had a choice of an infinity of possible worlds. Moreover, this has distinct consequences for Leibniz's version of mechanism. For, although he often wishes to speak as if his mechanistic philosophy is like that of the Boyle and others, it should be clear that if gaps are opened up in nature at the level of essences and those essences determine the physical or mechanical structure of bodies, then there should be gaps in the resulting physical objects in the phenomenal world. As a consequence, Leibniz's mechanistic world will not appear anything like the world of Boyle or Locke. Further, Leibniz whole-heartedly rejects Locke's skepticism: we can know facts about natural kinds and species. And yet on the semantic level, the meanings of natural kind terms "ain't in the [human] head." Ultimately, for Leibniz, essences are in the mind of God.