13

Modern Essentialism for Species and Its Animadversions

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We often hear about the death of essentialism in the philosophy of biology. Biological species are supposed to have no essences and no necessary characteristics. So according to Gillian Barker and Philip Kitcher, "There are no properties essential to *Drosophila melanogaster* (the famous fruit fly) or to *Homo sapiens*" (2014: 40). Before Darwin, the familiar story goes, species appeared to be definable in terms of their essences. But biologists now get by without these, "identifying species without supposing that they have essences" (Barker & Kitcher 2014: 41). Michael Ghiselin agrees: species "cannot be defined, in the sense of listing properties they simply must have" (1987: 129). For Michael Hardimon, "the concept species can be articulated in either essentialist or nonessentialist ways. Contemporary biology has vindicated the nonessentialist alternative as true of real existing species" (2013: 5).

As you would suppose, there is a whole nest of views associated with the offending essentialist doctrine. Some of the views are mistaken; there is no clean tradition. But there is a central strand of essentialism that enjoys some promise. It is helpful to sort through the different strands. The conclusion here will be that essentialism survives objections in an important, relevant form. However, not *all* work associated with species' essences can be supported by essence. A potential concern is whether species *essences*, coming to what they come to, will have lost their significance; or whether *species*, coming to what they come to, essentially, will have lost their significance. These concerns will be addressed in their turn.

A ROBUST ESSENTIALISM FOR SPECIES

Biologists today accept that all species they look at come from others, in an evolutionary tree: and they generally delimit species, or characterize them, according to their place in that tree. In this respect the mainstream "species concepts," as they are called, are more

or less uniformly historical or phylogenetic. Species tend to be characterized as a historically connected group of organisms with this or that origin in *particular* organisms on the family tree.

There are other things to take into account besides historical connections, in delimiting one species from another species; but history counts. What else counts, by way of delimiting species? Here informed answers vary. A classic answer as to what makes a historically connected group of interacting organisms into a species is that there is *interbreeding* or potential interbreeding between its constituent organisms, to the exclusion of outsiders to that species. This tells *which* of the historically demarcated organismal groups to which an organism like you belongs is its *species—H. sapiens*, say, as opposed to the mammals as a whole: your species is the group united to you by interbreeding potential, or "reproductive isolation." There are other proposals for what else binds a species besides historical roots (see LaPorte 2004 for elaboration of competitors). But let us take the most prominent approach for granted at the moment.

The interbreeding approach accounts for the Darwinian news that species come from other species in a historical lineage (and again, so do other live approaches). That is supposed to be a problem for essentialism. Here is Makmiller Pedroso: "Organisms are conspecific not because they necessarily share a certain property, the taxon's essence, but because they are (spatiotemporally restricted) parts of the same species," which is a historical lineage (Pedroso 2012: 182; see also Andreasen 2005: 105).

Let us be a little more specific about the central essentialist tenet at issue. Call it the "invariance" of a species' essence:

> INVARIANCE: There is a property that all and only members of any species share, namely its essence. It is a necessary truth that all members of the species share that property, because the property captures just what it is to be that species and not some other.

Criticisms of the proposal that species are characterized by any such essentialist invariance are legion. For Marc Ereshefsky, in order "to see the failure of essentialism we need only consider" this "first tenet," namely the central essentialist idea "that all and only the members of a kind have a common essence" (2010b).

The trouble is supposed to be that species have no genetic or otherwise qualitative characteristics that could serve as the essence: they vary too much genetically. Variability is at the very heart of Darwinism. Since *in*variance is central to essentialism, and *variability* is central to Darwinism, the two are thought to be irreconcilable. As Jody Hey puts it, the "idea, that variation among organisms is the crucial stuff of changing life and of life's progress, is devastating to essentialism" (2001: 62). By articulating a convincing evolutionary theory that accords a key role to variation, "Darwin delivered a one–two punch that pretty much obliterated essentialism" (Hey 2001: 61).

We should pause here to observe a controversial premise of the argument. In the past several years, explicit emphasis on the importance of a species' shared structure has grown, making it controversial to say that there are no genetic or structural characteristics common to a species. Indeed, even before this articulation found a voice relatively recently with the burgeoning of "HPC" ("homeostatic property cluster") accounts of species and other similar accounts, there had been celebrated species concepts that

allowed for genetic or structural characterizations of species; but informed discussion was more attentive to historical aspects of such species concepts than structural ones. (Joel Cracraft's favored species concept is an example of a species concept that was a major player long before people talked as much about genetic or qualitative characterizations of species, yet one that countenances genetically delimited species (see LaPorte 2004 for discussion). Cracraft also recognizes that species are delimited by *historical* pedigree, as do more recent champions of genetic essences (see Brigandt 2009: 80n; Devitt 2008: 346; Dumsday 2012).) Emphasis, not content, seems to have changed: there has been and continues to be a recognition, on the part of many, that species are delimited by qualitative characteristics like genetic or structural traits, *as well as historical* pedigree. For all of these workers, structure has a role, perhaps along with *reproductive isolation*, as one delimiting factor to distinguish a species. For all of these workers, history is another delimiting factor.

Let us ignore this complication concerning renewed attention to qualitative characteristics for species: let us suppose that a species has no genetic or qualitative characteristics shared by its members. Why is this supposed to be a problem for essentialism? That is not obvious. What *is* obvious, if biologists cannot identify any *genetic* or qualitative characteristics that could be essential to a historical species, is that the *essence* is not genetic or qualitative. A species might then instead be delimited essentially by its historical *origin* and by connecting relations between members. Such historical essences are familiar in the essentialist tradition. For example, Saul Kripke argues in classic works (for further discussion, see LaPorte 2004) that individuals essentially come from their own original stock, and not some other just like it. The idea is intuitive. You are an organism whose parts share a similar genetic makeup. But that is not what makes them parts of your body. Somatic mutations do not remove tissue from you or make it part of some other organism with genes more like those of the mutant tissue.

Organisms have historical essences. So it might be for species. So it *is* for species, if indeed species are properly delimited by origin and, say, reproductive connections: the respective origin and connections would then be what, roughly speaking, "accounts" for something being the species *Citrus limon* or *Homo sapiens* respectively, instead of anything else we might care to discuss. Nor is it problematic that species might or might not all be delimited by *reproduction*, so far as historical essentialism is concerned. Reproductive isolation is a popular standard but there are competitors—and a similar essentialist story applies to species as they are properly characterized by competitors, too. Perhaps species are lineages delineated by origins and *genetic* structure, or origins plus *ecological role*, say. If species are individuated *that* way, then essentialism is simply reformulated.[1]

This proposal that species have historical essences, now well known, is viewed with considerable suspicion in the informed community. Mark Ellis (2011: 356) complains that so-called historical essentialists "creatively revive the illusion of species essentialism." Many suggest that the proposal breaks with what tradition has *all along* been calling "essentialism," so that the proposal "robs essentialism of its essence" as Olivier Rieppel puts it (2010: 670); whether such historical essentialism "should be considered as essentialistic in some novel sense of the term, or liberated entirely from essentialism" is moot, he says. Ereshefsky goes further: historical "essentialism is not essentialism," because it does not uphold what is "core" to the tradition (2010b). Others voice similar qualms (see below).

Is so-called "historical essentialism" really just a new doctrine called by a venerable name? If so, then this defense of what is supposed to be essentialism—historical essentialism—enjoys all the benefits of theft over honest toil (apologies to Bertrand Russell).

Fortunately, historical essentialism is the real thing; it is not a cheat. There should be little question that essence, as outlined under the rubric "INVARIANCE," is deeply rooted in the essentialist tradition. *Whatever* essence is supposed to be, it is surely supposed to be *what* or *how* some entity has to be *in order to be* what it *is* rather than some other entity. Very roughly you could think of essence as what "defines" the item. This is the main thing essence is supposed to be all about. And this basic idea of essence would surely permit essences historical as well as qualitative.

Recall the essence of the lemon. Some have maintained, mistakenly, that the essence of *lemon*, or of this particular lemon tree, is purely genetic. But there is nothing about the nature of essences to preclude answers that accord better with recent biology, answers like, "the lemon's essence is to be what has such and such origin." The essentialist question is merely, "What makes the lemon to be *this* instead of that other citrus?" (I point to one and then another tree), or, to vary the question, "What is 'defining' of the lemon, in the respect that nothing else could qualify as fitting the definition?" Such a question arises however we delimit species; so "clearly that question will not go away," as Samir Okasha says, "if we think that *Citrus Limon*," being a biological species, has a history that differentiates it essentially (Okasha 2002: 194; Devitt is also especially clear on this point (2008: 347–348).

Historical essences are essences. They meet the requirements: they explain what it is to be something—namely, a historically delimited thing. Even so, you could still object that historical essences are not the *sort* of essences that essentialists and anti-essentialists have traditionally been talking about: you could argue this point on the grounds that context, say, reveals otherwise. Context can sometimes in this way limit the range of what is under discussion: thus, even though dust and air are "stuff," strictly speaking, context would rule out counting them as "stuff" remaining in a warehouse we are emptying of inventory. After the last of the inventory is gone, it is okay to say, "there's no more stuff there." If a neophyte objected, "Wait, there's still dust and air in there—so there's stuff after all!" we would conclude he did not know what we were talking about. In the same way, the contexts presupposed in traditional debates between essentialists and anti-essentialists might make it okay to say, "species have no essences." To say, "Wait, there are *historical* essences" might indicate a failure to understand what people have been talking about in the relevant contexts.

Have traditional contexts in fact suggested that historical origins are irrelevant to whether there are "essences"? On the contrary. First, as we have seen, recent generations of philosophers have recognized historical essences for other sorts of entities like individual *organisms*. Historical essences thus featured prominently in past generations of philosophical discussion well before the question of any application to species dawned—or rather re-dawned, because the application to *species* is not really new either. On the contrary, the alleged essentiality of a *species' historical origins* to that species is an old idea. Hence, long ago John Locke canvassed the position. As Locke characterizes him, the historical essentialist holds that a species has "a real essence, which he thinks certainly conveyed by generation." Locke himself worried that the position would mire us in

skepticism: "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 gathered that produced the other, to know whether this be a tiger or that tea?" (1995: III.vi.23). Historical essences counted as bona fide essences in the context of that debate over whether species have essences.

So there is nothing wrong-headed about being open to historical origins as essential to a species. Historical essences accord with the essentialist demands of INVARIANCE. They qualify as essences. And context has honored their relevance. They count as what essentialists and anti-essentialists have been talking about, traditionally.

TOO MANY DEMANDS ON ONE NOTION OF ESSENCE: ESSENCES FOR SPECIES AND FOR SPECIMENS

The primary job of essence, summarized in the foregoing rubric INVARIANCE, is to explain what it is to be this or that. That is what essence is about most fundamentally. But essences have been associated with less fundamental work, too. Essences have been associated with diverse work *other* than that limned by INVARIANCE, as well as work limned by INVARIANCE. Because diverse work has been attributed to essences, it is understandable that confusion has arisen about what essences are supposed to do, or whether self-declared "essentialists" today deserve the name. Let us consider some of the other work associated with essence, besides that most fundamental work limned by INVARIANCE.

An ancient line would require the essence of a species S not only to explain what it is to be S *itself*, but also what it is to be this or that individual organism *belonging* to S, in the following respect. Each organism belonging to S is sometimes thought *itself* to belong essentially: to have essentially the properties defining of S.

The history of ideas indicates repeatedly that when manifold demands are made upon a single notion, usually without proper distinctions, the confusing welter of demands must be sorted out; often enough, no single notion turns out to be able to bear the burden of all the different sorts of work attributed to one thing. So it may well be here. The doctrine that their species is essential to the separate *organisms* in the species seems much more problematic than the essentialist doctrine originally limned above with INVARIANCE, according to which there are distinguishing boundaries essential to a species itself, boundaries to which organisms have to conform if they are to belong to that species and not some other. So there is not much reason to think that essence, as articulated by INVARIANCE, also honors the demand that organisms essentially belong to their species. (We might call this doctrine "Essential Membership.")

The difficulty with Essential Membership is this: that current characterizations of species, those of the experts, do not seem amenable. Return to the best-established view according to which reproductive isolation does the job of delimiting. If that is so, then it would seem possible for an organism to belong to one species rather than another contingently. So suppose that a population of frogs becomes isolated on an island. Geographical isolation alone is not reproductive isolation. But such an isolate might develop slightly different reproductive tendencies that would discourage interbreeding with the parental stock on the mainland. Then the members of the isolate

would thereby qualify as belonging to a new species, but that could easily be by virtue of events *contingent* to *individual* frogs. Tendencies of an organism can be contingent to it, including reproductive habits.

You might object that dispositions in this case are not contingent to individuals because, you might say, *genetic* constitution would be responsible for a disposition or tendency to reproduce with the organisms of one lineage rather than another, which disposition qualifies that organism to be of the one species (which is a lineage) rather than the other; you might add that genetic constitution is essential to an organism and you might infer that reproductive isolation would therefore also be essential to individual frogs. But the objection would not seem to meet its mark. Let us assume, controversially (Ghiselin 1987: 137), that reproductive isolation must arise by way of genetic difference between the lineages isolated one from another. A new isolate of a parent lineage might indeed undergo a slight genetic change, causing its reproductive call to differ in tone, or causing the frogs to call at a different time. Distinctive *tones* or *calling times* are the sorts of things that serve as isolating mechanisms. In the foregoing case, even though a slight genetic variation causes a new isolate to qualify as a new species, distinct from the parental species by virtue of a genetically prompted mechanism that would prevent interbreeding between the two lineages, the reproductive isolation would still seem clearly to be contingent to any given frog—*not*, or not only, because the genetic change responsible for the distinctive reproductive routine is so slight that it would seem inessential to any given frog (though that seems reasonable to say), but also because other variables besides that slight genetic difference will be necessary for the distinctive features of the call that produce the isolation. The acoustic properties of a frog's call depend on variables such as the temperature of the surrounding environment, or other noises within earshot. These variables, which are surely not essential to any frog's being itself instead of some other individual, can cause the same frog, with its very same genetic tendencies, to sound a call that works a little differently. Because that difference is the sort of thing that causes reproductive isolation, that difference is therefore the sort of thing causing the frog to be a member of a new species instead of the one it would otherwise be a member of. There are many similar examples, but this one will serve to illustrate the basic problem in principle. Let us develop it a bit.

Suppose that a population S2 takes to an island, from the mainland stock species S. The island periodically swings to slightly higher temperatures than the mainland. So the island individuals of S2 adapt by becoming more flexible about the mating call: depending on the temperature, the ritual can sound a little shriller. Meanwhile, the mainland undergoes an influx of interfering noises in places. The stock species S adapts accordingly a lower call, depending on whether interference is present. Now, the isolate and the stock organisms are not reproductively isolated so long as they would, in general, cross. And conditions might typically allow for that—typically an island specimen of S2 would reproduce were it transplanted to the mainland—but not in the occasional special circumstances of the interfering noises. By parity a typical organism from the mainland species S might not be challenged at reproduction, were it sent to the island, except for the occasional season or part of a season during which temperatures rise. The specimen would not integrate with the shriller ritual.

So far there is no speciation. But if noise pollution were to become the norm on the mainland and a rise in temperature on the island, there *would* be reproductive

isolation—a settled, stronger-than-geographical barrier to reproductive integration. Now members of the two lineages would not belong to the same species. Instead, there would be two new species. There is the mainland species, S1, and the island species, S2 (plus the parent, S). Yet clearly the individual organisms belonging to S1 and S2 *could* be conspecific with members of S, for all their individual identities required. Were it not for noise and temperature-related pollution that does not compromise the individual identity of any individual specimen, the organisms in S1 and S2 would be members of S.[2]

TOO MANY DEMANDS ON ONE NOTION OF ESSENCE: ESSENCES AND THE LAW-LIKE SECURING OF PROPERTIES

Tradition has assigned too many roles to the same notion called "essence," when tradition has suggested that a species' essence must be essential to individuals. What other doctrines commonly associated with essence must be distinguished from the basic notion of *species essence* (from the rubric INVARIANCE)? Something often mentioned is the important theoretical role essence plays in supporting powerful *generalizations*.

Clusters of theoretically important properties are sometimes supposed to arise by nomological necessity from essence. Laws governing a species or other lineage might necessitate its child-rearing practices, metabolism, camouflage, social interaction, communication, culture, or other higher functions of intelligence, and so on.

Can properties supporting law-like generalizations be tightly associated with a species in this way? It is doubtful. We can illustrate briefly just for the reproductive approach. A single genetic mutation could switch a transition in breeding habits, and thus distinguish a new species. The bulk of the genetic heritage, with the best connection to non-historical properties, might divide saliently along other lines than reproductive ones. No cluster of important properties has to follow species divisions.

Consider by way of illustration a stock species that sends out colonies in a tripartite geographical dispersal. A colonial population B might become reproductively isolated by way of a minor genetic change from the stock species A1, while a second colony, A2, becomes geographically isolated from A1 but not reproductively isolated from A1—so A2 remains conspecific with A1. Yet A2, although conspecific with A1, might be the outsider with respect to salient law-like generalizations. A2 might lose law-like properties belonging to B and A1, having to do with camouflage or vision or whatnot, and A2 might acquire unique new such properties not shared by B and A1, which undergo less change. The salient law-like generalizations might be stronger between A1 and B than between A1 and A2, though species-lines break differently. Reproductive isolation is not the only candidate here for what counts as a division into species, but something similar could be said about other candidates, such as a switch of ecological role.

So species' essences are not to be tied too closely to non-historical properties or to law-like generalizations supported by clusters of properties. Often because of the organisms making up the lineage, there *will* be such a correlation; but not necessarily. Sometimes striking similarity is attended by rifts in interbreeding; other times, markedly different strains, so far as non-historical properties are concerned, can be counted as one species reproductively. There are plenty of observed cases of this (e.g., in marine

corals), and the theoretical point is clear in any case: historical essences of the sort species have could hardly be expected in any hard and fast way to assure better correlation to non-historical properties.

All this reflection on essence's connection with laws might make us uneasy: what we recognize and call "species" should have scientific significance. So if our characterizations of "species" fail to uphold law-like generalizations, should we conclude that "species" as we have characterized them fail to serve biological science, by failing to mark theoretically important groups? No.

If the species in fact delimited by the reproductive account and other accounts accepted by biologists *were* to turn out to be of little biological significance, then we should be sent back to the drawing board. We should be forced to discard the foregoing characterizations of "species" as *mis*characterizations. But that threat does not materialize because the species named by biologists are in fact of biological significance. Species as biologists characterize them do tolerably well at serving to frame theoretically important biological inquiry.

To be sure, law-like generalizations are important to some sorts of scientific inquiry, including some biological inquiry. But such generalizations might be unavailable or inappropriate in many salient biological contexts. Other biological contexts, which feature other sorts of inquiry and other sorts of answers, have their own value and salience in biology, as Stephen Jay Gould for one has emphasized: "Answers that invoke general laws of nature rather than particular contingencies of history" are not unimportant, then; but even so a good part of what biologists do is to look for explanations "rooted in history, pure and simple" (Gould 1991: 121). Sometimes a question has a historical answer: e.g., Why is QWERTY the standard? Answer: Because the keyboard started that way. Why do kiwis have oddities like a big egg? Answer: "Kiwis are as they are because they were as they were" (Gould 1991: 121).

Tight general laws of the sort associated with chemical elements' essences do not seem to characterize biological species' essences, and certainly would not seem to arise by metaphysical necessity from species' defining essences. Even so, theoretically interesting generalities tend to hold. Species are often observed to be causally integrated, as well as integrated genetically, morphologically, ecologically, behaviorally, and so on. They do not have to be; but they often are. Law-like connections to properties do not obtain by way of the necessity of essence; but for all that, they *tend* to hold.

WHEN CONSILIENCE FAILS: SPECIES' ESSENCES, SPECIESHOOD'S *ESSENCE* AND WHY THESE MATTER

Because consilience is not perfect, ecological and morphological distinctness can obtain without reproductive isolation, say, as it does in the case of oaks, the classic example. This is why there are competing species concepts, that is, different ways to characterize species. Thus, you might recognize one or another species of oaks as that *lineage* with such and such original population along with all and only the organisms united to it by *shared ecological role* (instead of reproductive ties). You might so characterize your species because ecology and not reproductive isolation seems to obtain and more importantly to explain what is salient about the oak lineage.

Reflection on this sort of discrepancy between species concepts might engender skepticism about whether species are one natural *category* of lineage. Perhaps the category of species is disjunctive: it embraces a motley mix of lineage types, important for different reasons and united by different sorts of mechanisms.

If some species are united reproductively and others ecologically, that might seem to threaten the integrity or theoretical interest of species essences. But that threat does not materialize. Suppose that the species category is disjunctive, because some species are reproductively united and others are ecologically united. This would not indicate that any one species—a species of oaks, say—has a disjunctive essence. It would not. That species' essence would be ecological, not *ecological OR reproductive*. Individual lineages like the different oaks or like *H. sapiens* would remain integrated and natural biologically, united by one measure or the other for species.

You might question whether the category *species* has any essence or at least any scientifically significant essence: its essence might turn out to be motley, and not worth recognizing. But for all that, there would be no reason to doubt that individual species' essences matter. After all, if the species themselves matter, then their several essences matter, because if the individual species matter, then it matters just what makes these species what they are.

Does the species *category* have a theoretically interesting essence? That is, is there a theoretical property that is defining of species (as opposed to a theoretical property that is defining of *Q. rubra* or of *H. sapiens*)? Or is the species category, rather, disjunctive or even gerrymandered? Some have even suggested that the category should be retired and that we should stop talking about "species" under a common label altogether. Again, there is no need to commit to much here by way of these issues, in order to establish an interesting species essentialism. Even if we were to retire—or, better, qualify by further specification—the common label "species," it would not undermine an important essentialism concerning the different species. However, I will suggest all too briefly that the category itself *is* of theoretical interest and that essentialism is plausible here too. First, there is more to be said concerning the significance of different species' essences.

An apparent threat to the significance of species' essences is implicit in the suggestion that individual species are not worth the biological attention accorded to them. Something like this can occasionally come across in the vibes of certain systematists who suggest that there is nothing distinguished about species as opposed to any other lineage (Velasco 2013: 10–14); yet even if this were so, it takes little away from the importance of species and their essences, because different levels of lineage *all* have importance. Think of the canines, say, a genus—or chihuahuas, an ancient breed from Asian stock, that coevolved with Native American humans. The canines and the chihuahuas are theoretically interesting lineages each with its own distinctive heritage.

And species may be especially important: they have certainly received special attention and recognition from biologists on the whole. As Kevin de Queiroz says:

> Biologists commonly assert that species are fundamental biological units, comparable in importance to fundamental units at lower levels of organization, such as organisms and cells. (2011: 29)

Such special attention is sometimes criticized; but my own sense, for what that is worth, is that biologists know by acquaintance that species are a good rough marker of about the level on which they ought to focus—even if there are different kinds of species and even if it is hard to articulate what is important about them. Biologists themselves certainly have a general sense that they have that tacit understanding, as even critics of the species concept(s) acknowledge (e.g., Hey 2001: especially 8–9, 24, 190).

The power of species comes into relief when we compare alternatives. Some workers seem to prefer *populations* of organisms within a species, say, instead of species, as a focal point (see, e.g., Velasco 2013: 10, 13, 14). But consider that no one cares about a population of Greeks colonizing a lonely island like Delos, however low their contact with the mainland, until something more important happens. When something more important does happen on an island, so that speciation occurs, *then* we care: the relatively recently evolved human "hobbit" species *Homo floresiensis* is headlines!

It is hard to focus on a rough level of distinctiveness for lineages without that level being around where one or another species concept would put it anyway; thus, for example, *populations* with distinctions marked enough to tempt a systematist to accord them recognition are captured in the nets of species "splitters." There are complications, to be sure (hence, the recognition of "metaspecies"). And species are not the only lineages worth recognition. Still, what seems most often most germane in the broad contexts where species are invoked—say, in conversations about biodiversity—is a salient measure that takes into account, roughly at least, both *distinctiveness* and also the history of *splitting* events marking permanent divisions (speciation). Divisions between species tend to provide such a measure, to a decent approximation, in the world as it happens to be (recall that there is *approximate* consilience). Consider this question, important for comparing the Anthropocene period in which we live to earlier periods, like the Cretaceous: "Were all of the periods with mass extinction events, like the extinction event that took the dinosaurs, caused by accelerated extinctions—or did some occur as a result of the *slowing down of speciation*?" It is a question that is closely, perhaps inextricably, tied to the idea of species: distinctive, permanent lineages that have separated stably. We need *some* handy measure to relate information like this quickly. Systematics is about conveying relevant information efficiently. It seems hard to do better than reference to species, which is in fact something like the settled standard.[3]

All of this talk about a handy measure or a common measure—specieshood—or, alternatively, of different measures—eco-specieshood, bio-specieshood, etc.—suggests a higher-order essentialism about the species category or categories. If there are such categories, then presumably they have certain characteristics integral to what it is to *be* the relevant category and not others. So although *species essentialism* can be defended in both fact and significance without settling these higher-order matters of category, we might still observe a plausible case for essentialism here, too, at the level of *category*.

The simplest approach to these matters is by way of assuming that different species concepts have their own interest and relevant application. Each has an essence. Eco-specieshood is essentially characterized as the category to which belong, or the property possessed by, those lineages that qualify as eco-species (like the different oak species). Lineages that amount to eco-species, like *Quercus Rubra*, qualify as eco-species by virtue of *playing a certain ecological role*, such as occupying a certain habitat, providing

such and such services like the removal of waste, the transformation of nutrients, or the maintenance of shelter. That is what it *is* to belong to that category; it specifies the essence of the category. Eco-specieshood, then, would seem itself to be an entity with an essence. Bio-specieshood is the correlate that makes appeal to reproductive isolation instead of ecology. And there are other species concepts, some of them cross-classifying. These categories would all have their own essence and they would all be interesting. Perhaps there is a species concept unifying all of these: a Unified Species Concept. If so, then this is its own higher-level species category whose essence explains how eco-species, bio-species, and so on, qualify to be *species-simpliciter*, according to a unified understanding of *species.*

CONCLUSION

In conclusion, interesting essentialism about species seems tenable. Species taken severally have historical essences. We might plausibly maintain essentialism even regarding the species category(/categories), though that conclusion has been but briefly discussed here.

NOTES

1. Because genetic characterizations tend not to hold hard and fast, some workers who suppose that genes play a role in essence do not realize that the essences they recognize, in effect, comply with INVARIANCE. Thus, in a nice elaboration of Richard Boyd's position that species have "HPC" essences, Michael Rubin explains that "traditionally, the essence of a natural kind is thought of as a property or a collection of properties whose exemplification by a given individual is both necessary and sufficient for that individual to count as a member of the kind." Nevertheless, says Rubin, "Boyd relaxes this requirement so that an individual may belong to an HPC kind even if it fails to instantiate some of the properties in the kind's HPC essence" (2008: 500–501). The error of such a move is exposed by considering the properties that tend to accompany a species. Are these part of its essence? Not if they merely *tend* to accompany the species. If there can be exceptions to the rule so far as possession of these properties goes (a single specimen might behave and look differently from other organisms in its species because of its particular genetic mutations), then there would need to be some account for why the mutant is still a member of the species; and the answer will invoke the species' *essence*—that is, what it *is* to be of that species. *That* remains invariant. It will generally come down to history, which indicates that the historical component of the relevant accounts of species is what is really doing all the work even though there *appear* to be more factors.
2. The most interesting and powerful essentialist rally of which I am aware comes from an unpublished paper by Manolo Martínez, who argues that the circumstances of contingency would be *rare*. Though I disagree with that conclusion, it can be conceded for purposes here. Rare would be enough to belie a problem in principle with associating two jobs with "essences." A distinction between species essence and individual essence is wanted.
3. Species in effect serve as the standard measure. Again, consider the use of species as an initial marker, a rough index, of biodiversity for purposes of conservation. Of course, groups narrower than species merit recognition. The chihuahua merits preservation, by virtue of its unique heritage. Similar words hold for lineages wider than species, and categories wider than species, such as *genre*, are sometimes used as an index for biodiversity measurement (typically only in conjunction with *species*, though—for example, by California Academy of Sciences 2014); but species are the common coin used to translate and then get "the best information out as quickly as possible to all of the end users" like policy makers and consumers, who "really desperately need accurate information to make informed decisions" (CAS 2013: from 1.25). If there *were* a better measure for some or all purposes for which *species* serves, it would have to be implemented efficiently, in view of its own user-friendliness and in view of a clear path to its widespread appeal: we cannot wait for 200 years' improved understanding or adjustment to formulate or spread the idea. Entrenchment matters (as Ereshefsky observes, 2010a: 420–421).

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