

Against Strong Speciesism

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ABSTRACT *Speciesism, difference of treatment based on an appeal to species membership, is often likened to racism and sexism, and condemned on those grounds. Some philosophers, however, reject this argument by analogy and instead forward an argument for speciesism based on a postulated right of species to compete for survival. This paper attacks this strong form of speciesism by showing that the underlying concept of 'species' is incoherent in the context of morality, and that strong speciesism has unacceptable corollaries.*

Introduction

The defender of speciesism asks:

Don't we have the right to compete with and exploit other species to preserve and protect the human species? Isn't that a reason to limit our morality to the human species?

Here we have naked speciesism at its starkest. The questioner considers and rejects the oft-advanced analogy between speciesism and racism or sexism. He rejects Singer's view that '[speciesism], properly understood, is virtually never defended' [1]. And in this, perhaps, he is correct, because there is a substantial body of literature that embraces speciesism. Consider the following statement by Gray (also note the gratuitous and unnecessary ad hominem)[2]:

... (philosophers and extremist members of animal rights movements apart) I would guess that the view that human beings matter to other human beings more than animals do is, to say the least, widespread. At any rate, I wish to defend speciesism here.

Another proud declaration of speciesism is made by Cohen[3]:

I am a speciesist. Speciesism is not merely plausible; it is essential for right conduct, because those who will not make the morally relevant distinctions among species are almost certain, in consequence, to misapprehend their true obligations.

Naked speciesism, contrary to Singer's view, poses a significant challenge to animal rights philosophy. It is therefore important to confront it head-on, rather than to hope that arguments based on analogies to racism and sexism will suffice to make it go away. To be successful, these arguments by analogy require that the speciesist accept that the species boundary is as morally arbitrary as, say, the sex boundary. But it is exactly the point of a

well-developed speciesist position to defend the assertion that the species boundary is not morally arbitrary.

Delineation of the Strong Speciesist Morality

There are many forms of the speciesist argument. We have seen one above that refers to the greater 'importance' of humans. Another popular variant asserts that humans have a 'special duty' to the human species. For our purposes, we distinguish between strong and weak forms of speciesism. The strong form can be concisely stated as follows:

Members of a species may do whatever is required to ensure the survival of that species, including exploiting other species.

The major point to note about the strong form is that an appeal is not made to any qualities that coincidentally are characteristic only of one species (e.g., human rationality). In contrast, the weak form makes such appeals. Consider the case of rationality. It is only because one group of organisms (humans) are significantly dominant in thinking power that we can consider calling rationalism a form of speciesism. If it were the case that 50 other 'species' shared humanity's thinking power, it would be inappropriate then to refer to rationalism as a form of speciesism. Thus, there is a valid distinction to be drawn between the strong and weak forms of speciesism. We choose in this paper to attack the strong form, and leave the weak form for future attacks. (The popular usage of 'speciesism' encompasses both the strong and weak forms.)

The above formulation of the strong speciesist position, although considered a priori benighted by Singer, has several virtues. First, it appears (at least initially) to be nonarbitrary; it is based on the scientific concept of species. Second, it can be regarded as satisfying Kant's Categorical Imperative ('act only according with a law that you can will would be a universal law'), because it is generalisable to other species; just as the human species has the right to exploit other species as they wish, so does (say) the chimpanzee species.

Three main attacks on the strong speciesist position can be mounted: 1) the species concept itself can be shown to be incoherent in the context of morality, 2) it can be shown that 'what is required' to ensure survival of a species is difficult to determine and may, in fact, place limits on the allowable exploitation — limits that are not typically observed by adherents of speciesist morality, and 3) it can be shown that the consequences of the strong speciesist position are unacceptable or absurd. Space allows us only to address in detail attacks 1 and 3. Attack 2 is, in any case, not decisive, because although it might result in a scaling back of the exploitation that is considered permissible, it leaves the strong speciesist position essentially intact.

With regard to the virtues of speciesism described above, this paper shows that the first virtue is illusory because arbitrariness is exposed upon close examination of the species concept. Furthermore, it shows that to escape from this conclusion, a retrenchment must be made from the strong speciesist position to either a weak form of speciesism or to a contingent humanism that sacrifices generality. This retrenchment constitutes an abandonment of generalisable, strong speciesist morality.

A Taxonomy of Species Concepts

Many species concepts have been proposed by biologists and philosophers, and this fact alone suggests that 'species' is a problematic concept. One might arrange these proposed concepts along a spectrum labelled at one end 'Conventionalism' and at the other end 'Realism'. Starting at the conventionalism end and moving toward the Realism end, we would encounter in sequence 'typism' (or essentialism), the 'phenetic concept', the 'evolutionary concept', the 'recognition concept', and finally the 'biological species concept'. Further complicating this already untidy explication of 'species' is the fact that many biologists embrace a pluralistic species concept, in effect combining several or all of the concepts mentioned.

As we shall see, the concepts aspire to greater objectivity and non-arbitrariness as they lie closer to the Realism end of the spectrum, and these qualities would seem to be desirable to base a system of ethics. If variety, 'race', etc., are not to be as relevant to morality as 'species', then a realistic species concept is required. Therefore, we concentrate primarily on the most realistic and arguably most 'successful' of the species concepts (at least in terms of the number of adherents): the biological species concept. We lack the space to deal with all the concepts here; nevertheless, we deal briefly with typism to show why one needs to be at the Realism end of the spectrum to properly ground a system of ethics.

The Arbitrary Nature of Typism

The idea that there is a set of properties that all and only the members of a group of animals possess, and that this group of animals therefore constitutes a 'species', is referred to as the type concept of species. This concept — referred to as essentialism in the biological literature and typism in this paper — runs into serious difficulties both conceptually and in its application to morality. We present enough of the problems below to show that typism is unable to support a consistent and generalisable morality, and that recourse must be made to a more modern and scientific concept of species.

The most potent objection to typism is that the classification involved is totally arbitrary both in partitioning and depth thereof. This point is well explained by Dawkins[4]:

One librarian might divide his collection into the following major categories: science, history, literature, other arts, foreign works, etc. Each of these major departments would be subdivided. The science wing of the library might have subdivisions into biology, geology, chemistry, physics, and so on . . . The library is, therefore hierarchically subdivided . . . But there is no unique hierarchy by which the books in a library must be arranged. A different librarian might choose to . . . not, for instance, have a separate foreign-language wing, but might prefer to house books, regardless of language, in their appropriate subject areas . . . [These plans] are quite different from each other, but would [both] work adequately and would be thought acceptable . . . So, there is no correct solution to the problem of how to classify books.

The arbitrariness of type-based classification makes it totally unsuitable as a basis for morality. A broad partitioning leads to the extension of morality; for example, if our classification distinguishes only animals from non-animals, then our morality could

subsume all animals. A fine partitioning leads to the restriction of morality; for example, if our classification has depth sufficient to include skin colour, then our morality could be constrained to a single human 'race'. Thus, how deep we choose to push our classification can radically affect the moralities that are derivable therefrom. At one extreme, the concept of species shrinks to a single organism; at the other extreme, it encompasses all organisms.

Clark writes [5]:

Plato, after all, denied that it was sensible to contrast human and non-human things, creatures of our specific kind and all others. We might as well divide the universe into cranes and non-cranes.

Obviously, a classification whose initial division is between humans and non-humans is very likely to result in a morality that treats humans and animals very differently. Indeed, Clark suggests that an objective type-based taxonomy would regard all the great apes, including humans, as a kind, leading to a morality that encompasses them all [6].

We will not dwell upon the well-known objections to typism found in the evolutionary literature. Suffice it here to mention them briefly. First, the existence of so-called sibling species, those that are isolated reproductively but virtually identical morphologically, and polytypic species, those containing conspicuously differing forms that can interbreed, represents a difficulty for classification based on type. Second, the 'line-drawing' problem arises, and forces us to ask where along a continuous type gradation the classificatory line should be placed. Sober makes this latter point in a technical manner [7]:

No phenotypic characteristic can be postulated as a species essence; the norm of reaction for each genotype shows that it is arbitrary to single out as privileged one phenotype as opposed to any other.

In addition to asking where a classificatory line is to be placed, we also must ask ourselves what magnitude of difference justifies drawing a line in the first place. This problem arises particularly vividly when the defender of type-based speciesism attempts to base his classification directly on the genotype, rather than on its phenotypic manifestations. In a recent posting to a Usenet newsgroup, a defender of speciesism happily claimed that the species concept could serve as a basis for morality because 'unlike species, human individuals never differ by more than 2 percent of their genetic content'. When asked whether the fact that bonobos and humans differ in genetic content by only 1.6 percent might affect his views, the poster chose instead to challenge the data. Unfortunately for him, the data is not in question. The technique used, DNA hybridisation, is well-known, respected, and in common use in the field of taxonomy, as well as in the better-known field of forensic DNA 'fingerprinting'.

Another fact that might be pointed out to the Usenet poster is that humans are significantly closer in genetic content to bonobos and chimpanzees than red-eyed vireos are to white-eyed vireos, which are accepted by taxonomists as two distinct species.

These facts lead one to question whether the magnitude of the genetic difference between humans and chimpanzees is big enough to justify the type and moral distinctions drawn between the two. But there are other difficult questions to be answered.

Which genes are the ones that confer rights? If it is answered that it is just the ones that differ between humans and chimps, then we see that the argument is tautologous. After all, why should rights be deserved solely on the basis of a certain sequence of genes?

We also must ask, assuming that genetic content is relevant, why the relevant boundary is at the species level, rather than at the gene, individual, subspecies, order, phylum, or kingdom levels.

The serious defender of strong speciesism must at this point renounce the type-based species concept and invoke a more realistic species concept. We will therefore consider now the paradigmatic realistic species concept: the biological species concept. This concept defines species as a group of reproductively isolated individuals. For example, humans and chimpanzees cannot interbreed, and are therefore considered to be of different species.

The biological species concept avoids the conceptual problems of typism and the specific problems of genetic typism described above. For example, the magnitude of the difference between two genetic programmes is seen as irrelevant; as long as they are incapable of interbreeding, the genetic programmes are distinct, and constitute the basis of 'species'.

Similarly, the question about which genes are the ones that confer rights can be answered simply: they are the ones that allow reproduction of the human species, and thus guarantee its continued existence and uniqueness (or conversely, genes that disallow reproduction deny rights).

Finally, the question about which is the appropriate boundary now can be answered: it is drawn at the species level because that is claimed to be the smallest division at which a distinct, coherent, and reproductively isolated genetic programme exists.

Let us consider now whether the biological species concept is the silver bullet that the defender of strong speciesism seeks, or whether it raises more difficulties than it solves.

The Incoherency of the Biological Species Concept

We learn in high-school and college that the biological species concept is neat and tidy. If two animals cannot interbreed to produce viable offspring, then they are of different species. Unfortunately, the concept is not so tidy and, in fact, there is a strong case for asserting that the species concept is merely a theoretical concept of the human mind and therefore unable to bear the moral weight that the speciesist wants to place upon it. Let us consider some of the factors leading to this conclusion.

Lions and tigers can interbreed to produce viable hybrids, yet they are reckoned to be of different species. Similarly, some groups of animals reckoned to be of the same species cannot interbreed. For example, the single species of owl monkey *Aotus trivergatus* contains several groups that cannot interbreed. Similarly, soldier termites are members of the same species as their fertile congeners, but they cannot interbreed. That the biological species concept admits of such exceptions (which are ubiquitous in nature) suggests that it may constitute nothing more than a theoretical construct.

Another problem for the biological species concept is that it is narrow in its applicability to the natural world. Since the idea of reproductive isolation assumes sexual reproduction, we cannot apply it to the myriad of asexually reproducing organisms (various microorganisms, fungi, plants, mites, insects, crustaceans, lizards, etc.). In these cases, we are forced to find some other notion of 'species', compromising the consistency and generality of the species concept (and hence strong speciesist morality). Wilson asserts that 'the lines drawn by the biologist around such species must be arbitrary' [8].

It is well-known that even where reproductive isolation is asserted, there is typically 'leakage' of the isolating mechanism. So even the idea of isolation is not absolute and constitutes little more than a theoretical construct. Mishler and Donoghue point out that 'isolation' ranges from complete interfertility to complete isolation and that stating what constitutes a significant discontinuity is problematic[9].

While on the subject of reproductive isolation, we need to point out that there is a serious ambiguity in the evolutionary literature over whether the interbreeding must be actual or potential. Consider first this quote from Wilson[10]:

Zoo-keepers have for years crossed tigers with lions. The offspring are called tiglons when the father is a tiger and ligers when the father is a lion. But the existence of these creatures proves nothing, except perhaps that lions and tigers are genetically closer to each other than they are to other kinds of big cats. The still unanswered question is, do lions and tigers hybridise freely when they meet under natural conditions?

For Wilson, then, the key is not whether two species can potentially interbreed, but whether they actually do. But consider now this quote from Mayr[11]:

The mechanisms that isolate one species reproductively from others are perhaps the most important set of attributes a species has, because they are, by definition, the species criteria . . . [The definition of] isolating mechanisms clearly excludes geographic isolation. San Francisco Bay, which keeps the prisoners of Alcatraz isolated from the other inhabitants of California, is not an isolating mechanism, nor is a mountain or a stream that separates two populations that are otherwise able to interbreed.

For Mayr, the key is whether the two species can potentially interbreed. The distinction is not a fine point for one attempting to base a morality on the species concept. What if a group of humans chooses not to interbreed with all other humans, or develops a ritual that prevents it from doing so? Is that group a new species? Is it therefore undeserving of the moral consideration of the rest of humanity? If we accept Mayr's potential interpretation, we will need to rewrite much of our accepted taxonomy, beginning with lions and tigers.

We have left for last arguments based on continuums over time and space because they are the strongest and most embarrassing for the defender of strong speciesism. We will show that where the defender of speciesism wants nice clear boundaries, there are, in fact, continuums. These continuums lead to the conclusion that there should also be a continuum of morality.

Consider first the existence of hybrid zones. Tudge writes[12]:

The fire-bellied toad and the yellow-bellied toad of Europe . . . are very different creatures. As their names suggest, they are different colors. They have different mating calls. They live in different habitats . . . Carl Linneus, the first great modern taxonomist who lived in the eighteenth century, had no difficulty in assigning them to different species . . . But the ranges of the two toads meet, . . . [and] despite their manifest differences — they mate to form hybrids . . . They form a 'hybrid zone' . . .

Tudge concludes:

But how would you classify the two species? By some definitions, they are the same species: they breed together to produce perfectly respectable hybrids. But common sense and observation proclaims that they are different; and the hybrids (apparently!) are not quite so viable as either parent species. So biologists in general are content to leave the two as separate species.

This example suggests that the idea of tidy, distinct reproductive isolates is erroneous. Dawkins describes another telling instance[13]:

The lawyer would be surprised and, I hope, intrigued by so-called 'ring species'. The best-known case is herring gull versus lesser black-backed gull. In Britain these are clearly distinct species, quite different in colour. Anybody can tell them apart. But if you follow the population of herring gulls westward round the North Pole to North America, then via Alaska across Siberia and back to Europe again, you will notice a curious fact. The 'herring gulls' gradually become less and less like herring gulls and more and more like lesser black-backed gulls until it turns out that our European lesser black-backed gulls actually are the other end of a ring that started out as herring gulls. At every stage around the ring, the birds are sufficiently similar to their neighbours to interbreed with them. Until, that is, the ends of the continuum are reached, in Europe. At this point the herring gull and the lesser black-backed gull never interbreed, although they are linked by a continuous series of interbreeding colleagues all the way round the world.

Dawkins goes on to point out that it is only a quirk of the human mind that drives us to place individuals firmly in this species or that. In fact, nature forces us to allow that an individual may lie half-way between what we may regard as two species, or even a tenth of the way from species A to species B.

Dawkins' example is a special instance of a clinal distribution: the cline wraps back upon itself. A cline is a distribution in which a trait varies across a spatially distributed group of organisms. Due to interbreeding across every point in the cline, there is gene flow from one end of the cline to the other. Yet, the variance along the cline may be sufficient that organisms at the two ends of the cline cannot interbreed. Such clinal distributions are common in nature.

These clinal distributions present a problem for the species concept. Are the organisms at the two ends of the cline members of different species? If so, at what point along the cline does the species change? If they are regarded as still members of the same species, would it then be the loss of an intervening group of organisms that would complete speciation? How can such a loss have moral significance?

The question about where along the cline the species changes leads us to a key insight. A response is possible if we answer relative to one end of the cline. We can then say the species changes at a point along the cline where the organisms at that point are no longer able to interbreed with the organisms at our reference end of the cline. This buys an answer at a great cost. First, the organisms adjacent to either side of the claimed boundary can interbreed, so it seems very wrong to assert that they are of different species. Second, selection of one point along a cline as the reference point is totally arbitrary.

Dawkins also describes a continuum in time that links humans back to their common ancestors with the chimpanzee[14]. He shows that over time, just as with space, the concept of tidy, distinct species delimited by interbreeding capability cannot stand up to the realities

of the natural world. Starting at humans and moving slowly along the gradation toward the ancestor, one never encounters a magic boundary at which organisms on either side cannot interbreed, and hence, at which one can say 'moral consideration ceases here'.

We see that an interbreeding boundary must be relative to a particular point in space and time. It is arbitrary to reference a given point as definitive of a species. Which point in space/time should be chosen as the baseline for 'human'? That is, which individual or small group of individuals should we choose as our reference point for interbreeding?

Even if we agree upon a group of presently living individuals to serve as our reference for humanity, what happens when they die? Even more problematic is how to use this reference group in practice. We cannot attempt to interbreed it with all other individuals. Yet, if we do not, then we are unable to recognise the others as of the human species without assuming the boundary we are trying to test. Sokal and Crovello put it this way: 'Establishment of biological species from fertility characteristics is entirely quixotic.' [15]

It is interesting to conclude with statements from some specialists about the conceptual problems with the species concept.

Darwin writes [16]:

I look at the term species, as one arbitrarily given for the sake of convenience to a set of individuals closely resembling each other.

Wilson writes [17]:

The biological-species concept has chronic deep problems. From the beginning of its first clear formulation at the turn of the century, it has been corroded by exceptions and ambiguities.

Kitcher writes [18]:

The concept of species was introduced as answer to certain theoretical desiderata.

Dunbar writes [19]:

Species, as we describe them, are matters of convenience rather than biological reality. The real world consists only of individuals who are more or less closely related to each other by virtue of descent from one or more common ancestors.

Finally, even Mayr (that staunch defender of the species concept!) writes [20]:

... it cannot be denied that an objective delimitation in a multidimensional system is an impossibility.

For Mayr, the key dimension is the genetic variation; thus, addition of either space or time renders the system multidimensional. A lack of objectivity, needless to say, is antithetical to generalisable morality.

Some Consequences of Strong Speciesism

The defender of speciesism retains the prerogative to ignore the foregoing material and obdurately continue to base his morality on the quicksand of the species boundary. If he does this, however, he needs to be prepared to accept some counter-intuitive consequences.

First, we consider the ‘Alpha-Centaurian’ argument. The idea here is that a superior ‘species’ of aliens could land at any time on earth and use their superior capabilities to enslave humans and exploit them (humans, apparently, taste better barbecued than any other organisms in the Solar System). If we are to be able to present a rational argument to these aliens about why they should not kill and eat us at will, it had better not be based on species boundaries. McGinn writes[21]:

Here the thought is that only space protects our species from the depredations of more powerful beings, so that space travel is a potential route to species demotion. Sheer distance is the saving contingency here. It is just luck that those aliens don’t live on the moon, or else we would be their playthings even now . . .

Apes would undoubtedly have been better off without us. They are cosmically unlucky in the way we would be if [the above nightmare became] reality. And just as we would fight to have the evil effects of such bad luck reversed in our case — using sound moral argument as our justification — so we should recognise that the bad luck of apes in having humans to contend with should not be allowed to continue unchecked . . . We might have been the ones in cages or on the vivisection tables: and it is a cast-iron certainty that we would not have liked it one bit. Morality, in short, should not be dictated by luck.

Returning to the original speciesist argument presented above, we can note that it is not restrictive enough to exclude practices that are almost universally rejected as immoral. For example, if any exploitation that benefits the human ‘species’ is acceptable, then enforced experiments on unwilling humans should be morally acceptable, provided the benefits outweigh the harms to the individual. If it is the fitness of the ‘species’ that is aimed at, it would follow that moral concern should be withheld from defective humans, the reproduction of which could reduce fitness, and from infertile people, who compete for resources but can’t contribute to genetic fitness. The species concept of morality gives us no way to protect individual rights against the claims of the species as a whole.

Consider now some scenarios for the future of humankind. Suppose that at some time in the future humans branch into what biologists call sibling species, i.e., species that are morphologically identical but reproductively isolated. This might arise due to mutations that cause a group of humans to have an extra chromosome, or, perhaps, a mutation to the germ cells or to the immune system may make the eggs and sperm from the respective groups incompatible. The question now arises as to whether the two human ‘species’ owe moral consideration to each other. If they do, then the species boundary has broken down.

Suppose a ‘species’ derives from humans and is superior in several interesting ways. Does this species receive moral consideration from humans? Do humans receive consideration from the new species? If we say that this new species does not receive consideration, we are in effect arguing that the human species cannot evolve without losing their rights. And, of course, it flies in the face of common sense to accept that a species essentially identical to humans but superior in several ways would not be deserving of the same moral consideration as that of humans. If we accept that both the ‘inferior’ human species and the superior one can have rights, then why shouldn’t we acknowledge the rights of the ‘inferior’ chimpanzee (and other) species?

Several evolutionists argue that ‘species’ is not the unit of importance as far as selection is concerned. For example, Ehrlich and Raven write[22]:

Species should not be thought of as evolutionary units held together by the cohesive force of gene flow . . . it is the locally interbreeding population and not the species that is clearly the evolutionary unit of importance.

The import of this is that if cohesiveness of a genotype is the object of morality, then it is the local population or group, that is morally important. If that is accepted, the ethical door is opened for egregiously wrong practices, such as racism and ethnic cleansing.

Finally, consider the analogy of the speciesist position rendered for groups of individuals: 'Members of a group may do whatever is required to ensure survival of that group, including exploiting other groups.' Is there anything that the speciesist can cite to reject this thesis while still accepting his own? Yet if he accepts this thesis, a large part of our accepted ethics would need to be discarded.

Some Objections Answered

Several objections to the proffered reasoning can be anticipated. Probably most important is the claim that the arguments given that undermine the species concept are irrelevant; it is argued that we know which creatures are human, and that the problems enumerated do not apply to the human species. The reply involves two main points.

First, it is not true that all the enumerated problems do not apply to humans, e.g., the problem of the time continuum is definitely applicable. Even in space, we do not know whether a group of 'humans' exists that may be reproductively isolated for one reason or another. But more significantly, it is merely a contingent fact that some of the known problems with the species concept may not currently apply to humans. Relative to evolutionary time scales, humans are virtually infants, having diverged only recently from our common ancestor with the chimpanzee. If humans manage to survive over evolutionarily significant time spans, increased variability will arise with the result that the problems described may become increasingly applicable.

Second, we must not lose sight of the fact that such a defence really amounts to an abandonment of the generalisable speciesist morality, because it asks us to look at the contingent facts surrounding one group of organisms, namely humans. The back-off from strong speciesism to contingent humanism (or 'lionism', etc.) ties morality to a space/time frame, and the conditions pertaining therein. This defence transforms the generalisable speciesist morality into a contingent humanistic morality. (Of course, there are people willing to defend a strong humanism, but an attack on that is the subject for another paper.)

A second objection asserts that there are enough discontinuities in nature to give real meaning to the species concept. While we cannot doubt that some discontinuities exist, it is the continuities that cause the problem, and the objection does not succeed in dispelling them. Considering the time dimension, the objection is simply wrong; if you accept evolutionary descent, you must accept gradual transformation and the lack of discontinuities (notwithstanding punctuationalism — see below). Considering the space domain, the objection is debatable. Finally, this objection suffers from the same flaw as the first: it relies upon contingencies for some groups of organisms. Shall we accept that our allegedly generalisable morality is applicable only to those groups that are fortunate enough to be delimited by spatial or other discontinuities?

In the context of discontinuities, we must take note of the objection that punctuationalism (the idea that evolution consists of long periods of stasis interrupted by periods of sudden change) makes the species concept more coherent. But punctuationalism is, as Dawkins points out, still a gradualist notion [23]. It does not invoke or require discontinuities in the sense that we have been using the term. The time scale over which the alleged periods of change occur are still very long by human, and hence, moral standards. And, of course, the very idea of punctuationalism is highly controversial and rejected by most evolutionary biologists.

Another objection asserts that the undermining of the species concept negates evolutionary theory and/or makes evolutionary biology impossible. This is misguided because the attack on the species concept leaves the idea of gradual descent with variation intact; that is all that is needed for an evolutionary theory. It is still possible, also, to have a taxonomy based upon eclectic sources: molecular methods (such as DNA hybridisation and sequencing), population studies, morphological criteria, and, indeed, gene-flow (reproductive isolation). These sources are viewed as being heuristics for taxonomy rather than as the determinants of 'real species'.

Some may assert that a Wittgensteinian approach is sufficient to give meaning to the term 'species'. Leaving aside the point that Wittgenstein's anti-essentialism appears to apply only to non-natural kinds, it must be observed that such an interpretation of 'species' is self-defeating when the goal is to ground a scientific and non-arbitrary meaning. Furthermore, Wittgenstein can be cited in our favour by pointing out that he asserted that a given term may have different meanings in different contexts. The term species may have meaning in the context of our everyday discourse or in the context of practical taxonomy, but those meanings are not coherent for use in the context of morality.

Finally, it may be objected that if there is no concept of real species, then there is no answer to the question 'What evolves?' We can answer simply that collections of genes evolve. Furthermore, if we must use the term 'species', it should be understood to refer to a smudge in the space/time continuum of organisms, fuzzily delimited by an eclectic range of heuristic devices.

Conclusion

In summary, it is clear that the species concept cannot bear the weight of a system of ethics. We conclude, then, that the strong form of speciesism cannot be adequately defended.

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NOTES

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