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The Value of Endangered Species

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1. Introduction

The infamous snail darter controversy of the 1970s raised an interesting philosophical problem, one that continues to arise, as illustrated by the more recent spotted owl controversy in the Pacific Northwest. The snail darter is a fish that eats snails; it is three and a half inches long, a relative of the perch, and ranges in color from brown to olive. At the time the Tellico Dam was proposed, the snail darter's only habitat was a region of the Tennessee River. The controversy arose because it was thought that the proposed dam would have eliminated the snail darter's habitat by creating a lake in that region of the Tennessee; thus, it was thought that building the dam would have jeopardized the snail darter's future. Did this fact provide any good reason not to build the dam?

In general, there are many good reasons not to destroy a species. Species can provide important medical resources for us. We enjoy watching wildlife, and destroying a species prevents people from having aesthetically pleasing experiences. There are many other ways that a species may benefit us. But consider the snail darter. It is not a particularly beautiful fish, and it has no known important medical benefit for people. From a human perspective, the snail darter may be completely useless. Let us suppose that it is. Furthermore, let us suppose that building the dam would not decrease the total number of fish. The snail darters would simply be replaced by another, more plentiful sort of darter. Does the snail darter have any other sort of value that would provide us with a good reason not to build the dam?

Some philosophers find it incredible that anyone would even seriously ask this question. For example, Judith Jarvis Thomson says that nobody would claim that it would be bad if just any species were exterminated:

> I gather that hundreds of species of ants (or is it termites?) become extinct every day: Is anyone seriously inclined to call that just plain a bad thing? Pandas are another matter, however. Dear living teddy bears!. . . So far as

> I can see, it is in being bad for us, and only in being bad for us, that their becoming extinct would be bad.[1]

Thomson would appear to be what might be called a conservationist. Let us stipulate that conservationism is the view that the only reason it is wrong to destroy a species is that the species may be of some value to human beings: species have instrumental value for human beings. A species may have instrumental value in many different ways: by providing medicinal benefits and aesthetic enjoyment, by making possible the expansion of human knowledge resulting from studying the species, by providing a tasty meal, and in many other ways. In the Tellico Dam scenario, the snail darter would have no such benefits for us. Thus the factors listed above could provide us with no reason not to destroy it.

Despite what Thomson says, however, there are actually many people who would say that destroying the snail darter would be wrong even if the snail darter had no instrumental value for people. Such people may be called preservationists. Let us call preservationism the view that there may be good reason not to destroy a species even if it has no use for people. If there would be no difference to the benefit of people, then given a choice between killing the last several blue whales or several sperm whales, a preservationist would kill the sperm whales. A conservationist would find no reason to choose one rather than the other.

A preservationist faces a difficulty, however, when he tries to justify his view. In recent years there have been at least three prominent attempts to justify preservationism. Robert Elliot has argued that it is worse to kill the last members of a species than to kill members of a flourishing species because the last members of a species have greater intrinsic value than members of non-endangered species.[2] Holmes Rolston III, Alastair Gunn, and Nicholas Rescher have argued that species themselves have intrinsic value beyond the intrinsic values of their members, which is what explains why it is worse to destroy the last members of a species.[3] Finally, Robin Attfield has argued that eliminating a species has additional negative instrumental value, not because it prevents us from gaining any benefits, but because it prevents future generations of that species from coming into existence.[4]

Unfortunately, each of these attempted justifications of preservationism seems to be inadequate, and preservationists must find another justification. Part of the reason that preservation has not been formulated coherently is that philosophers have failed to realize that intrinsic and instrumental value are not the only types of value at issue. If we recognize the existence of contributory value, along with Brentano's principle of *bonum variationis*, we may be able to defend a preservationist account of endangered species.

First, however, we must clear up two possible misunderstandings about preservationism. Alastair Gunn claims that "the preservationist values the

existence of species, perhaps of all natural kinds, for their own sake."[5] While some preservationists may indeed value species for their own sake, we may understand preservationism to be the view that it is worse to destroy a species than to destroy the same number of members of a similar but plentiful species, even when doing so results in no harm to humanity. This allows for a wider variety of views to be characterized as preservationist. Gunn makes a different claim about preservationism. He characterizes preservationism as the view "that it is always wrong to exterminate any species."[6] However, a reflective preservationist would reject this view. To hold a preservationist view, such as the view that species have intrinsic value, is not to say that it is always wrong to eliminate a species. It is merely to say that there is always some reason not to eliminate a species that may be outweighed by other, more important considerations.[7]

2. Three Attempts to Justify Preservationism

Robert Elliot has suggested that members of endangered species have more intrinsic value than other organisms. If we hold the traditional view of intrinsic value, Elliot's suggestion would appear to be incoherent. Consider the conception stated by G.E. Moore in "The Conception of Intrinsic Value": "To say that a kind of value is 'intrinsic' means merely that the question whether a thing possesses it, and in what degree it possesses it, depends solely on the intrinsic nature of the thing in question."[8] On this view, members of endangered species cannot have more intrinsic value than other organisms. After all, being rare is not an intrinsic property of anything.

But Elliot does not seem to be working with the traditional conception of intrinsic value. Instead, he seems to be introducing a new concept. He makes this clear in the following passage:

> We should note that intrinsic value is contrasted with instrumental value, where the latter is the value a thing has in virtue of contributing to the production of some other thing which has intrinsic value. The contrast is not between having value in virtue of certain intrinsic properties and having value in virtue of certain extrinsic properties.[9]

What is the new conception of intrinsic value? According to Elliot, the intrinsic value of something is a function of its "value-adding" and "value-subtracting" properties.[10] "Where the value-adding properties outweigh the value-subtracting properties, a thing has intrinsic value; in the converse case a thing has intrinsic disvalue; otherwise, the thing is value neutral."[11] Elliot defines "value-adding properties" as any properties that "increase the overall value of the thing which has them."[12] Elliot claims that value-adding proper-

ties may be either intrinsic or extrinsic properties: "More surprisingly, perhaps, value-adding properties need not be intrinsic properties of the object to which they add value."[13] Elliot's definition of "intrinsically good," or "good in itself," is as follows: " 'good in itself' has to be read as 'good in virtue of the (value-adding) properties it possesses'. Read thus, relational properties are not ruled out."[14] Elliot seems to think this is a virtue of his view: "This is an important point since substantive theories of environmental value do in fact attribute value on the basis of such relational properties as being rare."[15] Thus Elliot can account for the special value of endangered species in the following way: other things being equal, members of endangered species are intrinsically more valuable than other organisms in virtue of certain extrinsic properties they possess, such as rarity.

Elliot's view generates some strange results. In fact, on his view, it turns out that anything that has any value at all has intrinsic value. In particular, things that we would ordinarily take to be examples of instrumental value turn out to have intrinsic value on his view, since a value-adding property is any property that increases the overall value of something that has it, and something's overall value will often depend on its causal properties. For example, when I found my favorite shirt, which had been missing for several weeks, it made me very happy. It was, overall, a good thing that I found the shirt, in virtue of the fact that finding the shirt caused me to be happy. If causal properties are value-adding, then things that we ordinarily think of as having merely instrumental value, such as finding a shirt, would turn out to have intrinsic value. Clearly, however, finding my shirt was not intrinsically good. Thus, Elliot has failed to provide a useful conception of intrinsic value that contrasts with instrumental value. Henceforth we will use the term "intrinsic value" in line with the Moorean conception.

A more popular solution is suggested by Holmes Rolston, III. Rolston seems to hold that species themselves have intrinsic value.

> We might say that the prohibition of extinction does not rest on rights that species have but (so to speak) on rights that humans do not have . . . such a prohibition seems to depend on some value in the species as such, for there need be no prohibition against destroying a valueless thing.[16]

> Every extinction is a kind of superkilling. It kills forms (species), beyond individuals. It kills "essences" beyond "existences," the "soul" as well as the "body." It kills collectively, not just distributively.[17]

> (some say) no species – whatever "species" exactly is – can evaluate anything, and therefore nothing called "species" can be the holder of intrinsic value. . . . But we need to revise this logic.[18]

Alastair Gunn, Nicholas Rescher, and Rick O'Neil also seem to advocate this sort of solution: "An environmental ethic is nonspeciesist in that it values each living thing, and each type of living thing, for its own sake."[19] "Species do not just have an instrumental 'value for' man; they also have a value in their own right – an intrinsic value."[20] "It is sufficient to have established that on either conception some species possess intrinsic value."[21] If a species has intrinsic value, then it is easy to see why it would be worse to kill the last members of a species than to kill members of a flourishing species. Destruction of the last members eliminates two kinds of things with intrinsic value: the individual organisms killed and the species. Killing members of a flourishing species destroys only the organisms themselves.

Are species properties? Gunn suggests this view when he says that types of things are intrinsically valuable, as does Rolston when he says that extinctions kill forms. But it is hard to see how a property could be destroyed. Another view is that a species is a collection of organisms. On this conception, it is easier to see how a species may be destroyed. Rolston elsewhere seems to be endorsing the view that a species is some sort of superorganism. He says that "a species is a living historical form."[22] Henceforth let us understand a species simply to be a collection of organisms. The arguments that follow would apply equally well to Rolston's superorganism view, since on either view a species is constituted by individual organisms.

Whatever species are, attributing intrinsic value to species may be problematic in virtue of the fact that boundaries between species are somewhat arbitrary. Different taxonomists will divide organisms into species in different ways. Of course, boundaries between species are not completely arbitrary, for taxonomical decisions are grounded in real similarities between organisms, but taxonomists will differ as to which similarities are most important. Thus the number of species will depend upon decisions made by biologists. For example, consider the following case:

> The Baltimore oriole and the Bullock's oriole were long recognized and classified as two separate species of birds. As a result of extensive interbreeding between the two species in areas where their ranges overlapped, the American Ornithologists' Union recently declared that there were no longer two separate species; [members of] both ex-species are now called "northern orioles."[23]

If species have intrinsic value, then it would seem that the union's decision to classify the Baltimore oriole and Bullock's oriole as one species rather than two was *prima facie* morally wrong. Instead of two intrinsically valuable species, the union's decision leaves us with one, decreasing the intrinsic value of the world. If we assume a generic form of consequentialism, then Rolston's

proposal seems to imply that biologists have a *prima facie* moral obligation to divide the world into as many species as possible. This is plainly absurd.

This argument depends upon the contentious view that division of organisms into species may be done in different ways, none of which is really correct. Some philosophers will reject this view. Nevertheless, the view that species have intrinsic value still has problems. It seems to suffer from the same conceptual confusion as the view that members of endangered species have additional intrinsic value: it implies that something may have intrinsic value in virtue of its extrinsic properties. The intrinsic value of a group of organisms depends solely on the intrinsic properties of that group, whether or not that group constitutes a species. Consider two possible worlds, W1 and W2, each of which contains snail darters S_1-S_{100}. Suppose that S_1-S_{100} are intrinsically identical in the two worlds. In W1, S_1-S_{100} are the only snail darters. In W2, there are some extra snail darters S_{101}-S_{200}. Thus, in W1, S_1-S_{100} constitute the snail darter species, but in W2 they do not. Suppose that the members of W1 and W2 are deciding whether to build the Tellico Dam. In either world, if the dam is built, S_1-S_{100} will be exterminated. In W2, however, S_{101}-S_{200} would survive the building of the dam. The preservationist should be able to say that it is much worse to build the dam in W1 than in W2. But since the two collections of organisms, S_1-S_{100} in W1 and S_1-S_{100} in W2, are intrinsically identical, their intrinsic values must be identical. Thus we cannot explain why it is worse to destroy S_1-S_{100} in W1 than in W2 by claiming that the snail darter species has intrinsic value, for whatever intrinsic value the snail darter species possesses in W1 is possessed by something intrinsically identical in W2.

This problem may arise even for someone who holds the view that to say that species are intrinsically valuable is another way of saying that we value species intrinsically. J. Baird Callicott appears to hold such a view:

> Thus I think we have found, at last, an axiology which faithfully articulates and adequately grounds the moral intuition that nonhuman species [*qua* species] have "intrinsic value." They may not be valuable in themselves, but they may certainly be valued for themselves.[24]

To value a species intrinsically is presumably to value it in virtue of its intrinsic properties. But in the example we have considered, it is impossible to value snail darters S_1-S_{100} in W1 more than in W2 in virtue of their intrinsic properties, for there is no intrinsic difference between those organisms in the two worlds.

Robin Attfield rejects the view that species, *qua* species, have intrinsic value. He proposes another alternative.

> Another question concerns the widespread conviction that it is almost certainly wrong to eliminate a species. . . . [I]t is sometimes held that it can

> only be answered if we allow that species have a standing as such, which does not reduce to that of their members. But to adopt this supposition is to forget that when a species is eliminated, not only are the lives of its present members cut off but also the lives of what would have been its future members. . . . The reason why it is worse to wipe out a species than to kill some of its current membership while others survive in abundance may then lie in the value of a multitude of possible future lives, all of which are simultaneously pre-empted when their species is eliminated.[25]

Attfield's view is not that members of endangered species have more intrinsic value than other organisms. On his view, they have additional instrumental value, beyond whatever instrumental value they have for human exploitation. Destroying a species is instrumentally bad, since it prevents the existence of future offspring of the members of that species.

Unfortunately, this solution is no better. It fails to show why it is worse to kill the last members of a species than it would be to kill members of a flourishing species. After all, when members of a flourishing species are killed, all of their offspring are prevented from coming into existence as well. The existence or non-existence of other members of the species is not relevant. We cannot establish that the last members of a species have additional instrumental value unless we can provide an independent reason to think that the world is intrinsically better with that species than it would be without it. Without such a reason, we have no reason to think that the last members of a species have any additional instrumental value.

3. Contributory Value and the Value of Variety

When attempting to determine what is common to all of the failed solutions considered so far, we notice that each involves attributions of one or the other of only two sorts of value, intrinsic value and instrumental value. Many philosophers have thought that these are the only types of value and that instrumental value is the only type of non-intrinsic value.[26] This is a mistake. The instrumental value of something is a result of its causal relationships with other things. However, there are other extrinsic relations that can endow something with value, including, as G.E. Moore and W.D. Ross pointed out, part-whole relations. When something has value in virtue of its part-whole relations, we say that it has contributory value.

Consider the following example, taken from Leibniz.[27] A part of a painting might be very ugly, taken on its own. Its intrinsic aesthetic value might be negligible. But it might make the painting as a whole much more beautiful, because of its relations to the other parts of the painting. It would have great aesthetic value in virtue of its contribution to the value of the whole, and so

contributory value. Contributory value is distinct from instrumental value. The intrinsically ugly part of the painting does not stand in a cause and effect relationship with the painting, as a paintbrush does. The relationship is that of part to whole.

This aesthetic example is merely an analogy designed by Leibniz to help explain the existence of suffering in a perfectly harmonious world. Naturally, suffering is not good when considered all by itself. It is not intrinsically good. But if the suffering is experienced by someone vicious, it may increase the overall level of justice or harmony in the world. Again, the suffering does not cause something else good to occur. The value is not instrumental. Instead, according to Leibniz, the suffering makes the world better in virtue of the fact that it experienced by someone who is wicked and therefore deserves it, whether or not there are any good causal consequences. Brentano calls this the "law of retribution."[28] If Leibniz and Brentano are right about retribution, we might say that retribution has contributory value. While intrinsically bad, the retribution has value in virtue of being part of an organic unity consisting of both wickedness and retribution. When something has value in virtue of its part-whole relationships in this way, we say that it has contributory value.

Since contributory value is a little-discussed type of value, it will be useful to define it precisely.[29] C.I. Lewis provided the best characterization of contributory value:

> Let us call the value assignable to any transitory experience not – or not merely – by reason of the quality it immediately presents but on account of its contribution to some larger whole of experience, or to life altogether, the *contributory* value of it.[30]

Lewis's definition accounts for the contributory value of experiences. However, we might wish to provide a more general definition that allows for non-experiences, such as artworks or organisms, to have contributory value. The following definition captures the more general notion: The contributory value of something is the contribution it makes to the overall value of the world, less the intrinsic value of that thing. We may understand the contribution the thing makes to the overall value of the world to be the difference between the value of the world with it and the value of the world without it. Thus, in order for something to have positive contributory value, the contribution it makes to the value of the world must exceed its intrinsic value. In the case of retribution, if the suffering makes the world better but is intrinsically bad and instrumentally neutral, the definition entails that the suffering has contributory value.

Another way in which something might be thought to have contributory value is by contributing to the variety of the world. The view that variety is good has been held in this century by A.C. Ewing and Peter Miller, but the

view goes back at least to Leibniz.[31] In the *Monadology* Leibniz writes: "And by this means there is obtained as great variety as possible, along with the greatest possible order; that is to say, it is the way to get as much perfection as possible."[32] In the *Theodicy* he says "to multiply one and the same thing only would be superfluity, and poverty too."[33] Brentano also endorsed this view. In *Brentano and Intrinsic Value*, Roderick Chisholm explains Brentano's principle of *bonum variationis* by saying "other things being equal, it is better to combine two dissimilar goods than to combine two similar goods."[34] Chisholm uses the following example to illustrate this principle:

> Suppose, for example, that A is a beautiful painting, that B is a painting exactly like A, and that C is a beautiful piece of music. The aesthetic contemplation of A may have the same [intrinsic] value as that of B and also the same [intrinsic] value as that of C. But the whole that is the aesthetic contemplation of A followed by that of C is intrinsically better than that whole that is the aesthetic contemplation of A followed by that of B. Hence one could say that the value of a *bonum variationis* is greater than the sum of the values of its constituent parts.[35]

Consider the value of the contemplation of C here. Besides its intrinsic value, it also seems to have another kind of value, the value it contributes to the whole consisting of the contemplation of A and C. This kind of value is not instrumental value. Contemplating C may not cause anything good to occur. Its value depends on its part-whole relationships. It has contributory value.

If we hold, with Leibniz, Brentano, Ewing, and Miller, the principle of *bonum variationis*, we have a plausible justification of preservationism. Consider two worlds, Variety World and Uniformity World, with the same number of organisms, and suppose that the intrinsic value of each organism is the same. Suppose, however, that Variety World contains a great variety of organisms, including all the species we have on earth, while Uniformity World contains nothing but billions of snail darters, and possibly some snails. The principle of *bonum variationis* implies that Variety World is a better world than Uniformity World. If this is so, then we can see how killing the last snail darter in Variety World would be worse than killing an intrinsically identical snail darter in Uniformity World. The snail darter in Uniformity World does not make that world a more diverse planet. It is one of billions, so exterminating it would reduce the value of Uniformity World only by its intrinsic value, if we ignore instrumental value. The snail darter in Variety World, however, contributes to the diversity of that world. The world is intrinsically better with the snail darter than without, and by more than the intrinsic value of the snail darter. The snail darter has contributory value, in virtue of its contribution to the variety of organisms in that world. Hence we have a way to justify preservationism: the last member of a species has a type of value, contributory value, that it would

not have if it were a member of a flourishing species. This is why killing the last member of a species is worse than killing a member of a flourishing species.

Of course, this is only the beginning of a solution to this problem. We also need to say what sort of variety is important to the value of the world. For instance, destroying all the organisms born on the second Tuesday in August should not be seen as depleting the variety of organisms on earth in any important way, though it would be bad. On this question, we may yield to the experts. If biologists find a certain sort of variety to be important in explaining biological facts, then, *ceteris paribus*, diminishing that variety will be bad.

This solution is not subject to a problem that might arise for the view that species have intrinsic value. It does not matter how we divide up organisms into species. As long as the divisions are based on objective similarities, the members of a given species will have some property that is important from the point of view of biology and that no other organisms have. Thus, if it is destroyed, nothing will have that property. The world will be a more homogeneous, and hence, a less valuable, place. The solution also accounts for why it seems worse to kill the last alligators, for example, if they were not only the last alligators but also the last reptiles. Eliminating all the reptiles would reduce biological diversity much more than simply eliminating a single species. Other views may have difficulty accounting for this intuition.

There remains a potential vagueness in the notion of contributory value. Suppose that if one species were exterminated, a new species would immediately spring up to take its place, and that the new one would spring up only if the old one were exterminated. In such a case, it is not clear how to determine the contributory value of the old species. There is a sense in which it seems to contribute to the value of the world. However, there is another sense in which it does not, since the diversity level of the world would remain the same whether it were exterminated or not. It is in some way analogous to an individual cell in an organism. Just as one cell can be replaced by another with no important change in the organism, the old species can be replaced by the new one with no loss of diversity. The vagueness is in the meaning of "what remains." Is what would remain were the old species removed from the world simply the rest of the actual world, or is it another possible world? If it is the rest of the actual world, the old species has contributory value, since the new species is not part of the rest of the world. The new species would not exist unless the old one were to go extinct. If it is another possible world, and the closest possible world in which the old species is eliminated is a world with the new one, then the old species would not have contributory value.[36]

It is best to understand contributory value as making a comparison between possible worlds. If a species really is valuable, then its existence makes the world better than it would have been otherwise. This would seem to mean

that the world is better than the closest world in which that species does not exist. In the unlikely event that a species is unnecessary for the maintenance of a given level of diversity, it has no contributory value. It does not make a difference to the value of the world. Such would be the case with the old species. But it should be pointed out that this example is not realistic, so the distinction is unlikely to matter. When a species becomes extinct, a new one never immediately replaces it. The longer it would take for the diversity level to return to the pre-extinction level were the old species to become extinct, the more contributory value it would have. In a case like this one, even if biological diversity provides us with no reason to care about preserving the old species, we might still have a good reason not to destroy its members. We can still appeal to the intrinsic values or rights of the individual organisms that make up the species. It is just that we might have no more reason to care about those organisms than members of other species. An appeal to diversity will not work.

4. Objections and Replies

Like the views rejected earlier, the view we are considering utilizes the notion of intrinsic value. Some philosophers will find this unacceptable. Historically, pragmatists such as John Dewey and Monroe Beardsley have been critical of intrinsic value.[37] More recently, Bryan Norton has launched a pragmatist critique of intrinsic value.[38] According to Norton, belief in intrinsic value makes sense only within a Cartesian worldview. Since, according to Norton, the Cartesian worldview is outdated, we have no reason to believe in concepts like intrinsic value that make sense only within that worldview. Instead, we should develop a post-modern or post-Cartesian environmental ethic.

Norton's argument is complicated. The idea seems to be roughly as follows. The motivation behind positing a notion of intrinsic value is that intrinsic value is required to establish objectivity in ethics. "The first explanation rests on a commitment to respond to the just discussed need of environmentalists to claim that their values and goals are 'objective,' epistemologically, and that these values rest on more than subjective preferences."[39] According to Norton, philosophers who defend intrinsic value hold a particular view about objectivity: a characteristic is objective only if it exists "independently of human consciousness."[40] Of course, even subjectivists may believe in a distinction between intrinsic and extrinsic value.[41] Thus, the solution here does not depend on the possibility of what Norton calls Cartesian objectivity, which Norton rejects. According to Norton, this notion of objectivity requires a representational theory of perception, which in turn requires some form of foundationalism. He holds, however, that all forms of foundationalism are

unacceptable and that we must reject objectivity and adopt a pragmatic or post-modern worldview. Naturally, there are enormous gaps in this argument that require further argument. But a good case can be made that critiques of objectivity made by pragmatists and post-modernists are unfounded or even incoherent.[42]

Assuming that there is such a thing as intrinsic value, there is a view similar in some ways to Rolston's that might be thought to be better than the one we have considered. It might be thought that instead of saying that diversity is good, we could say that instantiation of biological properties is intrinsically good. For any biologically important property, the state of affairs consisting of its being instantiated would be intrinsically good. This would result in a view somewhat similar to the view that species have intrinsic value, without necessarily placing any emphasis on particular ways of dividing organisms into species. Such a view could apparently account for the wrongness of exterminating a species, since when all of the members of a species are destroyed, the state of affairs consisting of the species being instantiated will no longer be true. Furthermore, such a view would have no need for the possibly mysterious concept of contributory value.

This view might indeed be able to mirror the results that the view we have considered gives, and it seems to be a coherent view. However, it might have some problems. For one thing, this view does not allow us to attribute any particular value to the rare organisms themselves. When an animal is one of the last of its kind, it seems to be especially valuable in some way. The proposed view does not attribute any value to the organism itself. It merely attributes value to an existential state of affairs that the organism itself does not enter into at all. The view we have considered attributes contributory value to the rare organism, so it seems that it can account for the special value of rare organisms better than the view just presented.

Lilly-Marlene Russow raises another objection in the following passage:

> Some appeals to intrinsic value are grounded in the intuition that diversity itself is a virtue. If so, it would seem incumbent upon us to create new species wherever possible, even bizarre ones that would have no purpose other than to be different. Something other than diversity must therefore be valued.[43]

Russow's objection seems powerful. Certainly few people would argue that we are obliged to create new species. Yet if variety makes the world better, then, if we assume an appropriate version of consequentialism, we ought to do just that.

Several points are in order here. First, while appropriate sorts of variety make the world better, variety is not the only thing that makes the world better. This is an important point, since it seems likely that attempting to create

new species would be extremely risky. Besides contributing to the variety of organisms, it might also produce many unwanted and disastrous side effects for people and for the planet. The existence of a new species, while contributorily good, might well be instrumentally bad. Thus the commonly held view that we should not create new species should not be taken at face value, at least as a criticism of the view that there is value in variety.

More important, however, is the fact that this criticism applies to just about any preservationist view. In fact, it applies equally to conservationist views. If we hold that species have intrinsic value, then we must hold that, provided the cost is not prohibitive and there are no significant negative side effects, we should create new species, since doing so would increase the amount of intrinsic value in the world. If we are conservationists who hold that species are valuable only because of potential medical benefits they can provide, then we must hold that we should create new species in case they might hold some as-yet-unknown cure for a deadly disease. The criticism even applies to Russow's own conservationist view. Russow holds that we ought not destroy species because it would deprive people of the aesthetic pleasures of watching members of those species: "we value and protect animals because of their aesthetic value, not because they are members of a given species."[44] Why, then, does Russow not hold that we should create new species whose sole purpose is to be aesthetically pleasing?

If Russow's criticism sinks all plausible views about the value of members of rare species, then we have two choices: we must either reject conservationism and preservationism altogether or revise our thinking about the rightness of creating species. Given these two choices, it is best to revise our thinking. If somehow we were able to eliminate all possible negative consequences of creating new species, and if our resources were not better spent elsewhere, then indeed, there would be nothing wrong with creating new species.

The second objection is raised by Callicott. It is an objection to a view that he calls "Holistic Rationalism":

> However, if one defends one's intuition that biological impoverishment is objectively wrong by positing organic richness as objectively good, one might well be accused of temporal parochialism and a very subtle form of human arrogance. . . . A holistic rationalist could not regret the massive die-off of the late Cretaceous because it made possible our yet richer mammal-populated world. . . . Nonhuman life would go on even after nuclear holocaust. In time speciation would occur and species would radiate anew. . . . The new Age (of Insects, perhaps) would eventually be just as diverse, orderly, harmonious, and stable and thus no less good than our current ecosystem with its present complement of species.[45]

Callicott's point is that a holistic rationalist has no reason to think that exterminating a species, or even thousands of species, is bad, as long as one day the species will be replaced by other species. In fact the world seems to be undergoing a massive extinction event as a result of human activity. According to E.O. Wilson, species are going extinct at a rate "hundreds or thousands of times higher than before the coming of man. They cannot be balanced by new evolution in any period of time that has meaning for the human race."[46] If the current wave of extinctions is similar to past episodes, a complete recovery could require tens of millions of years.[47] It has been argued that destroying habitat, the primary way in which people destroy species, inhibits speciation. Geerat Vermeij claims that "the likelihood of speciation will be small if, as seems likely, refuges from human exploitation are kept small."[48] We should realize that as long as there are people around behaving the way they currently behave, it is unlikely that species will radiate anew, as Callicott suggests.

But even supposing that people will one day become extinct themselves, allowing speciation to occur, the view we are considering does not entail that there would be nothing bad about this. We can hold that biological diversity increases the value of the world without claiming that it is the only thing that can increase the value of the world. If *Homo sapiens* became extinct and were replaced by a species of insect, as Callicott suggests, the world might not be less biologically diverse, but it would lack many other sorts of value that depend upon humanity. In particular, our pleasant experiences would be missing from the world, many of which seem valuable, and it is questionable whether insects could have equally valuable experiences.

The most important point to make about Callicott's argument is that when the number of species decreases, the value of the world thereby decreases. Thus it is perfectly reasonable to regret the loss of the snail darter, even if the snail darter will one day be replaced by a new species of darter. During the time between the extinction of the snail darter and the emergence of the new species, the value of the world will have been diminished. Consider the following analogy. Suppose that we are considering the view that human life is valuable, and suppose someone were to object to this view as follows: "Imagine that ninety percent of humanity is destroyed in a disaster. Eventually, after tens of millions of years, the remaining ten percent will rebuild the human population to its previous point. Someone who holds that human life is valuable cannot object to the disaster, since the new civilization will contain just as much human life as the old one." The reply to such an argument is obvious: the intermediate millions of years, with their decreased human population, bring down the value of the world. Similarly, the many years between extinction and speciation, with their biological impoverishment, bring down the value of the world in Callicott's example. We may regret the extinction of species, even if others eventually replace them.[49]

Notes

1. Judith Thomson, "The Right and the Good," *Journal of Philosophy* 94 (1997), p. 294n.
2. See Robert Elliot, "Intrinsic Value, Environmental Obligation and Naturalness," *Monist* 75 (1992).
3. See Holmes Rolston, *Environmental Ethics: Duties to and Values in the Natural World* (Philadelphia: Temple University Press, 1988); Alastair Gunn, "Why Should We Care About Rare Species?" *Environmental Ethics* 2 (1980); and Nicholas Rescher, *Unpopular Essays on Technological Progress* (Pittsburgh, Pa.: University of Pittsburgh Press, 1980).
4. Robin Attfield, *A Theory of Value and Obligation* (New York: Croom Helm, 1987); Attfield, *The Ethics of Environmental Concern* (Athens, Ga.: The University of Georgia Press, 1991).
5. Gunn, "Preserving Rare Species," in *Earthbound: New Introductory Essays in Environmental Ethics*, ed. Tom Regan (Philadelphia: Temple University Press, 1984), p. 330.
6. Ibid., p. 330.
7. See Rescher, op. cit. p. 87.
8. G.E. Moore, *Philosophical Studies* (New York: The Humanities Press, 1951), p. 260.
9. Elliot, op. cit., p. 139.
10. Ibid., pp. 138–139.
11. Ibid., p. 139.
12. Ibid., p. 138.
13. Ibid., p. 139.
14. Ibid.
15. Ibid.
16. Rolston, op. cit., p. 131.
17. Ibid., p. 144.
18. Ibid., p. 150.
19. Gunn, "Why Should We Care About Rare Species?" op. cit., p. 36.
20. Rescher, op. cit., p. 80.
21. Rick O'Neil, "Intrinsic Value, Moral Standing, and Species," *Environmental Ethics* 19 (1997), p. 49.
22. Rolston, op. cit., p. 135.
23. Lilly-Marlene Russow, "Why Do Species Matter?" *Environmental Ethics* 3 (1981), p. 104.
24. J. Baird Callicott, "The Intrinsic Value of Nonhuman Species," in *The Preservation of Species: The Value of Biological Diversity*, ed. Bryan Norton (Princeton, N.J.: Princeton University Press, 1986), p. 160.
25. Attfield, *A Theory of Value and Obligation*, op. cit., pp. 19–20. Also see Attfield, *The Ethics of Environmental Concern*, op. cit., p. 151.
26. See Callicott, op. cit., p. 139.
27. G.W. Leibniz, *The Monadology and Other Writings* (London: Oxford University Press, 1898), p. 347.
28. Roderick Chisholm, *Brentano and Intrinsic Value* (Cambridge, England: Cambridge University Press, 1986), pp. 71–72.
29. See G.E. Moore, *Ethics* (New York: Oxford University Press, 1912), p. 107; W.D. Ross, The *Right and the Good* (Oxford: Oxford University Press, 1930), p. 72; William Frankena, *Ethics* (Englewood Cliffs, N.J.: Prentice-Hall, 1963), p. 66; and C.D. Broad, *Ethics* (Dordrecht: Martinus Nijhoff Publishers, 1985), p. 258.

30. C.I. Lewis, *The Ground and Nature of the Right* (New York: Columbia University Press, 1955), p. 68.
31. See A.C. Ewing, *Value and Reality* (London: George Allen & Unwin, 1973), p. 221, and Peter Miller, "Value as Richness: Toward a Value Theory for an Expanded Naturalism in Environmental Ethics," *Environmental Ethics* 4 (1982), p. 108n.
32. Leibniz, op. cit., p. 249.
33. Leibniz, *Theodicy* (New Haven, Conn.: Yale University Press, 1952), p. 198.
34. Chisholm, op. cit., pp. 70–71.
35. Ibid., p. 71.
36. See David Lewis, *On the Plurality of Worlds* (New York: Basil Blackwell, 1986).
37. See John Dewey, *Theory of Valuation* (Chicago: University of Chicago Press, 1939), and Monroe Beardsley, "Intrinsic Value," *Philosophy and Phenomenological Research* 26 (1965).
38. Bryan Norton, "Epistemology and Environmental Values," *Monist* 75 (1992).
39. Ibid., p. 213.
40. Ibid., p. 215.
41. See John O'Neill, "The Varieties of Intrinsic Value," *Monist* 75 (1992).
42. See Margarita Rosa Levin, "A Defense of Objectivity," in *The Theory of Knowledge: Classical and Contemporary Readings*, ed. Louis Pojman (Belmont, Calif.: Wadsworth Publishing Co., 1999).
43. Russow, op. cit., p. 109.
44. Ibid., p. 112.
45. Callicott, op. cit., p. 151.
46. E.O. Wilson, *The Diversity of Life* (Cambridge, Mass.: Harvard University Press, 1992), p. 346.
47. Ibid., p. 31.
48. Geerat Vermeij, "The Biology of Human-Caused Extinction," in Norton, *The Preservation of Species*, op. cit., p. 44.
49. This paper was presented at the University of Massachusetts at Amherst and Brown University; I thank those who were present on those occasions, especially my commentators, Erik Wielenberg and Jason Kawall, for their excellent comments. I also thank Ed Abrams for helpful discussion. I am especially indebted to Fred Feldman and two anonymous referees for helpful criticisms of earlier drafts of this paper.