ANTHROPOCENTRISM AND THE ARGUMENT FROM GAIA THEORY

THOMAS J. DONAHUE

Anthropocentrism holds that the only things valuable in themselves are: human beings, their desires and needs, and the satisfaction of those. In turn, Gaia theory holds that the Earth and all creatures on it constitute something akin to a vast living being. Many layfolk maintain that Gaia theory implies the falsity of anthropocentrism, and thus puts the kibosh on that doctrine. But philosophical writers deny this implication. This paper therefore argues for what we may call “the Kibosh Thesis”—that Gaia theory, when correctly understood, does indeed put the kibosh on anthropocentrism. It defends this thesis by appealing to “the Part-Whole Thesis”—that no parts of a living being which do not constitute the whole being can have as much intrinsic value as the being itself has. Since the evidence supporting Gaia theory is mounting, this thesis appears to provide a fairly strong argument against anthropocentrism. In arguing for this position, I show why anthropocentrism is a plausible doctrine, specify Gaia theory’s main claims, meet the main philosophical objections to the Kibosh Thesis, and develop the argument from the Part-Whole Thesis.

Anthropocentrism is the view that the only things valuable in themselves are: human beings; their desires, needs, and purposes; and the satis-
faction of those. In turn, Gaia theory holds that the Earth and all creatures on it constitute something akin to a super-organism—a vast living being. This paper aims to show that if Gaia theory is true, then it is likely that anthropocentrism is false. Hence, in the words of green politician Jonathon Porritt (1987, 207), “Were such a hypothesis [confirmed], it would certainly put the kibosh on any lingering anthropocentric fantasies!” Let us call this, in honor of Porritt and other Green publicists, “the Kibosh Thesis.”

The Thesis has incurred considerable skepticism in philosophical quarters. For example, Michael F. Smith, Andrew Dobson, and Tim Hayward have all denied that there is any reliable inference from Gaia theory to the falsity of anthropocentrism.1 I hope to show that this skepticism is misplaced, and that there is indeed a fairly reliable argumentative route from Gaia to the doctrine’s falsity.2

Of course, this exercise would be merely academic if we had no good reasons for accepting Gaia theory. But in fact the theory has made ten successful predictions (Lovelock 2004, 3; Margulis 2004, 9); it has been scientifically fruitful, helping to open new fields of scientific research, especially Earth system science (Lawton 2001; Lovelock 2006, 162);3 and some of its main tenets, unorthodox when the theory was first proposed, were in 2001 promulgated in a declaration signed by many scientists (Lenton 2004, 15).4 So, since predictive power and fruitfulness are criteria for theory choice, we are not just considering the implications of a crazy hypothesis. Hence, if I can establish this Thesis, then there are decent, though not conclusive, reasons for taking a skeptical stance toward anthropocentrism.

The paper is organized as follows. Part 2 gives reasons for thinking that Gaia theory is scientifically plausible, and hence that its implications are worth considering. Many, perhaps most, scientists believe that Gaia theory is obviously false or has been decisively discredited; so a response to such beliefs is necessary. Such a response requires that I specify the main claims of Gaia theory. So here I aim to rationally reconstruct the claims made in the various presentations of the theory by its chief proponents, James E. Lovelock and Lynn Margulis, so as to identify the formulation of the theory that is the most scientifically defensible. In particular, this will require analyzing the theory’s claim that the Earth and all creatures on it can be seen as comprising a giant living being. Part 3 then gives an account of anthropocentrism and some reasons for accepting it.
This Part aims to bring out the doctrine’s plausibility and appeal, in order to display the hurdles that any argument against anthropocentrism must clear. I shall try to show that, to succeed against anthropocentrism, the argument from Gaia Theory must clear some high hurdles. Part 4 then considers the objections to the Kibosh Thesis which have been brought by Michael F. Smith and Tim Hayward. It tries to show that these objections are far from decisive, and that the truth or falsity of the Thesis is a live issue. Parts 5 and 6 will then present and evaluate an argument from Gaia theory against anthropocentrism. The argument turns on the claim that no parts of a living being which do not constitute the whole being can have as much intrinsic value as the being itself has; this claim I call the Part-Whole Thesis. Part 5 will present a schema of an argument from the Part-Whole Thesis to a moderate version of the Kibosh Thesis. Part 6 will then explicate and defend the argument’s premises, including the crucial Part-Whole Thesis. Part 7 closes.

2. THE PLAUSIBILITY OF GAIA THEORY.

This paper examines Gaia theory’s implications. But clearly, we should not waste our time in considering the implications of a theory that is wildly implausible or decisively discredited. Many, perhaps most, scientists think that Gaia theory is both. So I shall have to make a case for the plausibility of Gaia theory, a case showing that the theory is a serious scientific construct, which has not been decisively discredited, and which has many theoretical virtues.

I have already listed above several of the theory’s virtues: It has been predictively successful, with ten successful predictions to its credit. It has proved scientifically fecund, generating not only new research problems and hypotheses, but a whole new scientific field: Earth system science. Moreover, it has proven testable and has emerged successful when tested against several models (Kleidon 2002). Above all, it possesses the theoretical virtue of unifying power or consilience—it explains and thus unifies a great many large-scale global facts about climate and the environment, as well as the remarkable persistence of life on this planet (Lenton and Wilkinson 2003, 2), (albeit cp. Kirchner 1991, 41). When we combine this with the fact that Gaia does not seem to have a genuine rival theory—a theory with the same target entities that explains them differently—it seems fair to conclude that the theory has a number of explanatory virtues.
So much for the theory’s advantages. Let us now turn to the objections brought against the theory, which are widely thought to have decisively discredited it. Three basic objections appear to have been brought against the theory, objections arguing that it lacks the explanatory virtues of coherence with other theoretical commitments and of empirical adequacy. I shall present each of these objections in turn, showing how each ultimately fails to discredit the theory. But to do this, we must first have a precise specification of the theory’s main claims.

To accomplish this, we do best to examine the writings of Gaia theory’s founder and chief proponent, James E. Lovelock, while checking them against the writings of the theory’s co-founder, Lynn Margulis, as well as those of the theory’s leading proponents in current earth science: Timothy Lenton, David Wilkinson, and Axel Kleidon. I believe that the theory as it now stands, after some 35 years of controversy, testing, and reformulation, has the following structure. It makes twelve main claims:

G1. The surface of the Earth and everything on it is a self-regulating system composed of all the Earth’s organisms (the biota), surface rocks, ocean, atmosphere, and that part of the Earth’s crust that interacts with surface processes. We may call this total system “Gaia” (Lovelock 2006, 162; Lenton and van Oijen 2002, 684).


G4. By means of this self-regulation, Gaia keeps the climate and chemical composition of the Earth in homeostasis, until some internal contradiction or external force causes a jump to a new stable state (Lovelock 1988, 13; Wilkinson 1999, 533). (Homeostasis is the ability to maintain a relatively constant internal environment.)

G5. Gaia has the self-regulation capacity because evolution tends to favor those organisms that make their environment more comfortable for life, and to select against those that make their environment less favorable to life. But this is generally a by-product of natural selec-
tion; conduciveness to regulation need not be a trait for which it is itself selected (Lenton 1998, 441–45; Lovelock 2004, 3–4). We may call this, using biologists’ jargon, “the ultimate explanation” of Gaia’s self-regulation capacity.

G6. Particular periods of self-regulation occur because of a complicated feedback process occurring among the biota and their environment, which is driven by the free energy available from sunlight (Lovelock 1988, 31). We may call this “the proximate explanation” of Gaia’s self-regulation.

G7. The whole Gaia system evolves as one entity (though of course individual species and Earth regions also undergo their own separate processes of evolution) (Lovelock 2004, 2; 1988, 29–30; 2006, 162).

G8. Just as the evolution of life on Earth—the biota—is shaped by the Earth’s physical environment and the changes it undergoes, so the evolution of the Earth’s physical environment is shaped by life on Earth and the changes it undergoes. Just as species shape and are shaped by their environments, so the Earth’s biota shape and are shaped by its physical environment (Lovelock 1988, 30, 33–34; Kleidon 2002, 384; Kooijman 2004).

G9. Gaia—the whole system—acquired its self-regulation capacity through its own evolution. The Earth system did not always have this capacity (Lovelock 2006, 23).

G10. Since it self-regulates in the way described, and since it evolves as a single entity, we may say that Gaia is self-organizing (Lovelock 1988, 31).

G11. Some of Gaia’s features are the same as some—but not all—of the features usually taken to be essential features of a living being. The similarity with living beings bears scientific comparison (Lovelock 2006, 16; cp. Margulis 1998, 123; cp. Turney 2003, 111–12).

G12. The Earth system and its biota—Gaia—may be seen, metaphorically, as a giant living being (Lovelock 2004, 2; 2006, 16, 17; Wilkinson 1999, 533).

This, I submit, is the structure of the present version of Gaia theory. For convenience, the theory may be described as holding that the Earth system is very much like a giant organism.

Given its structure, it is evident that the theory should not be confused with its parent, the Gaia hypothesis, which was formulated by Lovelock.
and Margulis in the early 1970s. The hypothesis holds that “life on Earth actively keeps Earth’s surface conditions always favorable for whatever is then the contemporary ensemble of organisms” (Lovelock 2006, 162). Lovelock eventually gave up this hypothesis, on the ground that what regulates surface conditions is not life on earth, but the Gaia system as a whole. Gaia theory, a more complex intellectual product, resulted from this rethinking.

Now that we have in hand a specification of Gaia theory, we are in a position to consider the main objections brought against the theory, objections widely thought to have discredited it as a live option in science. There appear to be three main objections which have prominently been brought against the theory: the objection from organismhood, the objection from selfish natural selection, and the objection from positive feedback.

The first objection, perhaps the most well-known, was leveled by Richard Dawkins. It complains that the theory lacks the explanatory virtue of coherence with theoretical commitments: in this case, coherence with the theory of evolution by natural selection. The objection complains that Gaia theory implies that Gaia is an organism, or at least a being that has adapted to its environment. But, the objection complains, the Darwinian theory of evolution by natural selection holds that any organism, as well as any being that has adapted, must be the result of a process of natural selection. But clearly there cannot have been natural selection of planets! Planets do not have offspring, and so cannot leave descendants to survive and reproduce. So Gaia theory fails, because it clearly contradicts a key tenet of Darwinian evolutionary theory (Dawkins 1999, 234-237).

The reply to this objection is that Gaia theory does not claim that Gaia is literally an organism or that it has adapted. It is true that Lovelock has occasionally called Gaia a literal superorganism (1979, 1988). But this is a broader use of the term than that with which biologists work. It basically just means a tightly coupled system composed of life and its environment (Lenton and Wilkinson 2003, 10). Gaia theory claims only that viewing the Earth system as an organism is a useful metaphor, which helps us to appreciate the ways that Gaia is like a superorganism. It nowhere claims that Gaia actually is an organism or superorganism. Nor does it claim that Gaia has itself adapted in the way that organisms do. The theory does claim that Gaia theory is an adaptive system (Lenton and van Oijen 2002), but that is not the same as calling it an adaptive organism.
The second main objection to Gaia theory, that from selfish natural selection, was first famously propounded by Ford Doolittle, the eminent evolutionary theorist. It has latterly been endorsed by the equally distinguished evolutionist W. D. Hamilton. It too complains that the theory lacks the virtue of coherence with the Darwinian theory of evolution by natural selection. The objection starts by noting that Gaia theory holds that the biota help to self-regulate the entire planet. But, the objection continues, since the biota is made up of individual species, then at least some of these species must have acquired features that help to further Gaia’s self-regulation. However, such features will often require the members of such species to act against their own selfish interests—they will sometimes have to do things that sacrifice their own selfish interests in order to contribute to Gaia’s self-regulation. For example, it might be in a species’ own best interests to destroy a rain-forest or deaden a large water source, even though doing this would present an obstacle to Gaia’s continuing to self-regulate. Moreover, the objection continues, species could only have acquired the putative trait of contributing to Gaia’s self-regulation through natural selection. But, according to the Darwinian theory of natural selection, selection operates at the level of selfish individuals concerned above all with their own survival in their local habitats. Traits which weaken such individuals’ ability to survive in their local habitats cannot have been selected for, not if they contribute only to the global goal of Gaian self-regulation, rather than to the survival of the individuals’ own kin. So, according to the Darwinian theory, species could not have acquired these putative traits. The payoffs both to the individuals and their kin are too small to counterbalance the sacrifices involved in being selected for such traits (Doolittle 1981; Hamilton 1995). So Gaia theory has an implication which directly contradicts one of the central tenets of Darwinism.

The reply to this objection is that it invalidly infers from the claim that Gaia-supporting traits cannot have been selected for to the claim that Darwinism must deny that species could have acquired these traits. For traits can also be acquired as by-products of natural selection, they need not always be the objects of selection (Lenton 1998). Moreover, there are various plausible models that hypothesize about how species could acquire these traits as by-products of natural selection (Watson and Lovelock 1983; Lenton 1998; Lenton and van Oijen 2002), and they do...
so without any invocation of teleology or final causation (Lenton 1998). These traits are not acquired in order that Gaia can self-regulate, they are merely by-products of natural selection.

The third and final objection comes from within earth science, and is most famously leveled by J.W. Kirchner. It complains that Gaia theory lacks the explanatory virtue of empirical adequacy, on the grounds that there exists plenty of observable positive feedback in the life-climate feedback process. The objection begins by claiming that Gaia theory implies that the feedback process between the biota and its environment mostly generates negative feedback, which is necessary to keep the earth’s climate stable and homeostatic. For Gaia theory claims that the self-regulation process keeps the Earth’s climate more or less homeostatic, and it is negative feedback alone which can do this. Positive feedback disrupts homeostasis, while negative feedback furthers it. However, the evidence from the climate and biological record suggests that biotic feedback processes often are positive, generating instability in the climate and environment. So the theory’s implications about feedback are contradicted by the available evidence (Kirchner 2003, 24–31).

The reply to this objection is that Gaia theory does not imply anything that would deny that biotic feedback processes often are positive. The theory claims only that Gaia self-regulates so as to keep the Earth’s surface conditions favorable for contemporary life, and keeps the climate and chemical composition of the Earth in homeostasis, a relatively stable internal state. These claims are entirely compatible with the generalization that biotic feedback processes are often positive and destabilizing. For Gaia theory to be contradicted, we would need evidence showing either that most feedback processes are positive, or that those which are positive have a much greater effect on the system’s overall stability than negative feedback processes. In other words, what we need is evidence showing that the biotic feedback processes do not keep the climate in a relatively stable state, or do not keep surface conditions favorable for contemporary life. But Kirchner’s objection does not present such evidence. So the objection from positive feedback does not seem to refute Gaia theory.

Such seem to be the chief objections to Gaia theory. I have tried to show that there are strong replies to these objections, and that these replies, taken together with the theory’s explanatory virtues, give us serious reason to doubt that Gaia theory has been decisively discredited. To be sure, the arguments given here do not prove that Gaia theory is true, or
even that it is the best available theory dealing with its target entities. But they do try to show that Gaia theory is a serious scientific construct, a plausible, non-refuted theory. If so, then it is worth our while to consider the theory’s implications for anthropocentrism.

3. WHY ANTHROPOCENTRISM IS PLAUSIBLE.

Many environmental philosophers today assume that anthropocentrism is deeply implausible. But that assumption is false. Anthropocentrism is a plausible and appealing doctrine. This Part aims to show why. It does so in two steps. The first consists in showing that anthropocentrism does not in fact imply two ugly consequences oft attributed to it. The second step consists in showing that there are decent reasons for accepting the doctrine.

Let us take the first step, and consider two ugly doctrines which anthropocentrism is often thought to imply, but in fact does not. First, it is often held that anthropocentrism implies the Dominion Thesis, the view that “man is entitled to manipulate the earth and all its non-human contents as he wants.” A famous argument for the implication has been presented by Richard and Val Routley (Routley and Routley 1995, 127). It runs thus: Anthropocentrism must deny that the earth and all its non-human contents have intrinsic value. So it must hold that the earth and its non-human contents can only have instrumental value, or no value at all. But what has only instrumental value must, on anthropocentric principles, serve human interests. And humans are, on those principles, entitled to treat as they wish anything which must serve human interests. As for anything which has neither intrinsic nor instrumental value, it cannot be abused or have its value diminished. So humans are entitled to treat it, too, as they wish. Hence the Dominion Thesis.

If anthropocentrism did imply the Dominion Thesis, that would, in my opinion, decisively refute the doctrine. But the implication does not hold good (even though a good many anthropocentrists have embraced the Thesis). The trouble with the Routleys’ argument is the middle premise, according to which humans are, on anthropocentric principles, entitled to treat as they wish anything which must serve human interests. Let us call this the Entitlement View. This view is false. The anthropocentrist need not hold that humans are so entitled. The reasons are as follows.

Recall the claim made by anthropocentrism—that the only things valuable in themselves are human beings; their desires, needs, and pur-
poses; and the satisfaction of those. The Entitlement View does not follow from this claim. For suppose I accept anthropocentrism. I still run into the problem that any plausible anthropocentric morality will forbid me from treating things in such a way that they needlessly harm other human beings. For example, suppose we concede that a mountain must serve human interests. Still, on any plausible anthropocentric morality, I may not strip mine the mountain such that the resulting sludge contaminates a nearby town's water supply. The same would hold true even if (implausibly) all humanity agreed to use a certain thing in a way that needlessly harmed some human beings. But then it follows that on any plausible anthropocentric morality, it is false that humans are entitled to treat as they wish anything which must serve human interests. So the Entitlement View is false.

Defenders of the Dominion implication might reply that a weaker version of the Entitlement View still holds good: namely, that on anthropocentrist principles, humans are entitled to treat as they wish anything which must serve human interests, so long as they do not violate any of the tenets of any plausible anthropocentric morality. But once this concession is made, the route to the Dominion Thesis seems to be blocked. For it is hard to see how one could reach the thesis that “man is entitled to manipulate the earth and all its non-human contents as he wants” by combining anthropocentrism with this weakened Entitlement View. So it seems that anthropocentrism does not imply the Dominion Thesis.

Another ugly consequence attributed to anthropocentrism is the view that human beings cannot have general obligations not to harm plants, non-human animals, or ecosystems. The idea here is that, on anthropocentric principles, one cannot have obligations not to harm such beings unless incurs the obligations by promises, contracts, or the fact that the beings are someone else’s property. Let us call this “the No-obligation Thesis.”

This Thesis fails, because it does not take into account all the ways that we can incur obligations. If, by harming an ecosystem, I would be needlessly harming other human beings, then clearly on anthropocentric principles I have an obligation not to harm the ecosystem. More interestingly, even if in harming the ecosystem I would not be harming other human beings, I might still have an anthropocentric obligation not to harm the ecosystem. For suppose that a great number of people strongly desire that the ecosystem not be harmed, and have connected some of their hopes
and plans with its not being harmed (Yellowstone National Park might be such an ecosystem). On anthropocentric principles, it is quite possible that I would then have an obligation not to harm that ecosystem, even if the harm I might do would not (seriously) harm or endanger any human beings. And since promises, contracts, and property do not figure here, it seems that the No-obligation Thesis is also false.

We have shown, then, that anthropocentrism does not have two ugly consequences that are often attributed to it. So it is not as wildly implausible as some people seem to think. Moreover, the doctrine not only avoids wild implausibility, it is also genuinely plausible. This can be shown by considering two decent arguments for it.¹⁹

The first of these we may call “the argument from subjective value.” It hinges on the claim that values are created by a subject’s valuing. Values, the argument runs, are created by the act or process of valuing. There are no mind-independent objective values, for such alleged values would be metaphysically “queer,” not something which science—our best guide to what actually exists—would recognize.²⁰ The argument then claims that what valuers principally value, what they all mostly tend to accord chief importance to, is what has intrinsic value. According to this claim, something has intrinsic value only if it is what the set of all valuers mostly tend to accord chief importance to. Everything else has either instrumental value or no value. The argument then maintains that the only valuers known to us are human beings. It then holds that what all human beings mostly tend to accord chief importance to is human beings, their desires, needs, and purposes, and the satisfaction of those. Hence anthropocentrism.

That is one argument for anthropocentrism. I myself would ultimately reject the first premise, but I believe that supporting that rejection would take a good deal of work. So the argument is at least plausible.

Let us then turn to the second argument. This we may call “the argument from special dignity.” The main idea is that any being that has the following feature must have a special dignity and rank, a dignity which far outstrips the dignity of any being that does not have it. This feature is: Membership in a class in which all members have the potential for, and most of whose members frequently exhibit, the following traits: (1) planful rational agency, (2) self-conscious moral agency, (3) the ability to hope that one can leave things better than they were in the past.

Let’s examine each of these three traits in turn. By “planful rational
agency,” I mean the frequently exercised ability to act for plans, intentions, and reasons, where one often acts according to the long-term plans one has set. A long-term plan is a set of intentions which picks out certain ends or goals and which specifies means to achieving those ends.\(^{21}\)

Self-conscious moral agency is a two-part condition. For one has this kind of agency if (a) one is capable of acting and living in ways that make a moral and ethical difference—in ways that satisfy, exceed, or violate the requirements and aspirations of morality and ethics; and (b) one is aware, first, that one has the capability described in (a), and, second, that the requirements and aspirations of morality and ethics apply to oneself as well as to all other moral agents.

Take finally the ability to hope that one can leave things better than in the past. To have this ability, three conditions must be met. First, one must have a sense of history, which is a set of beliefs about the way things were in the past, combined with the belief that matters are different now than they were then. Second, one must have a judgment about how morally good or bad things were in the past. Third, one must have the desire that things will be better, partly as a result of one’s own actions, than they were in the past.

So the dignity argument’s main idea is that any member of a class in which all members have the potential for, and most of whose members frequently exhibit, these three traits, must have a special and unequalled dignity and rank.\(^{22}\) The reason is that only the members of that class can be full-blooded moral agents. Since full-blooded moral agency deserves more respect than anything else in the universe, the members of the class of beings who can be full-blooded moral agents have a dignity and rank that outstrips that of any other beings.

With these master premises in hand, the argument moves to anthropocentric conclusions. It relies on the findings of science and various skeptical arguments against the existence of gods and angels to argue that human beings are the only class of beings in which all members have the potential for, and most of whose members frequently exhibit, the three traits in question. So as far as we know, the argument runs, not even highly intelligent animals like dolphins, elephants, or non-human great apes display all of these traits: planful rational agency, self-conscious moral agency, and the ability to hope that one can leave things better than in the past.\(^{23}\)
From this, the dignity argument infers that human beings are the only beings in the universe who have a special, unequalled, dignity and rank. The argument then lodges a final premise: that those and only those beings which have such dignity have intrinsic value; and the same goes for their desires, needs, and purposes, and the satisfaction of those. Hence anthropocentrism.

That is another argument for anthropocentrism. I myself think that the final premise dooms the argument to ultimate failure. But it would take a good deal of reasoning to prove that premise false. So the argument’s conclusion is plausible.

If the foregoing is right, then it seems that anthropocentrism is a plausible doctrine. It is a view that deserves scrutiny. So there is a point to asking whether Gaia theory might imply that it is false.

4. OBJECTIONS TO THE KIBOSH THESIS.

I want now to consider objections to the Kibosh Thesis brought by Michael F. Smith and Tim Hayward. My aim here is to show that the truth or falsity of the Kibosh Thesis is a live issue. I shall try to show that these objections, while interesting, do not give us conclusive reasons for rejecting the Thesis. Let us take Smith’s objection first.

Smith argues that the Kibosh Thesis forms the apex of what he terms “eco-holism,” the view that human beings’ place in nature is that of a locus in an interdependent network of organisms. Smith presents the argument from Gaian eco-holism to the Kibosh Thesis as follows. If humans are such a locus, then we should see other natural things as having intrinsic worth, and see ourselves as just one among many such natural things (Smith 1991, 150–51). So if we accept Gaian eco-holism, we should reject anthropocentrism.

Against this argument, Smith objects that its second premise is far from obvious: Why should we accept that maintaining eco-holism commits us to seeing other natural things as having intrinsic worth? In his words, “one could clearly grasp an ecological understanding of our place in nature and yet still treat other organisms as mere means to human ends” (Smith 1991, 150). The trouble with this objection is that it provides no positive reason for rejecting the second premise. Its only support for rejecting that premise is that the argument as presented provides no reason for accepting it. The objection does not, then, evaluate the premise.
on the merits. Hence I think the objection does not present a good reason for rejecting the Kibosh Thesis.

Let us then turn to Tim Hayward’s objection to the Thesis. Hayward presents the argument from Gaia theory against anthropocentrism as follows. Gaia theory, Hayward maintains, claims that there will always be harmony in the whole of nature; nature will always find a balance. The Kibosh argument as presented by Hayward then maintains that if there is harmony in the whole of nature, then the whole itself has intrinsic value. So, on Gaia principles, anthropocentrism, which holds that only human beings and their desires have intrinsic value, is false (Hayward 1994, 32).

Against this argument, Hayward objects that it presents no reason for accepting its second premise. Why should we think that if there is harmony in the whole of nature, then the whole itself has intrinsic value (Hayward 1994, 32–33)? Hayward concludes from this that the argument for the Kibosh Thesis fails. But just as with Smith’s objection to the Thesis, so with Hayward’s. It presents no positive reason for rejecting the premise to which it objects. It rejects the premise on the slender ground that no reason has been presented for accepting it. That hardly amounts to a refutation. So the objection here seems weak at best.

If my arguments here are right, then two objections brought against the Kibosh Thesis by philosophical writers both fail. It seems, then, that the truth or falsity of the Thesis is a live issue.

5. THE ARGUMENT FROM GAIA THEORY.

With this account of Gaia theory in hand, I now turn to the argument for the Kibosh Thesis. I shall present the argument in two steps, breaking it across this Part and the next. Part 5 gives a schematic version of the argument, and Part 6 presents detailed discussion of each premise and the considerations backing it.

The argument makes two key moves. In the first, it relies on the Part-Whole Thesis, which claims that no parts of a living being which do not constitute the whole being can have as much intrinsic value as the being itself has. In the second, it notices that Gaia theory claims that Gaia and all creatures on it has many features which several scientifically well-motivated definitions of “living being” would maintain are sufficient for counting as a living being. It calls a being of that kind a “semi-living being.” Given this, the argument premises that if the Part-Whole Thesis is true, then it is probable that the Part-Whole Thesis holds true of semi-living beings.
beings as well. From this, it follows that Gaia theory implies that, probably, all Earthbound human beings do not have as much intrinsic value as Gaia and all creatures on it. Which means that, probably, the truth of Gaia theory would refute anthropocentrism. This result is a moderate, probabilistic version of the Kibosh Thesis.

Schematically, then, the argument runs:

1. Gaia theory implies that the Earth’s surface, crust, and atmosphere and all creatures on and in them—Gaia—is self-sustaining, has metabolism, has parts with functions, is autopoietic, is homeostatic, has behavior which reveals some sort of purposiveness, and is closed to efficient causation from without. (Premise)
2. Several scientifically well-motivated definitions of “living being” maintain that any being which has all those properties counts as a living being. (Premise)
3. Call a being with features such that several scientifically well-motivated definitions of “living being” would maintain that it is a living being, a “semi-living being.” (Definition)
4. No parts of a living being which do not constitute the whole being can have as much intrinsic value as the being itself has. (Premise. The Part-Whole Thesis)
5. If [Part-Whole Thesis], then, probably, no parts of a semi-living being which do not constitute the whole being can have as much intrinsic value as the being itself has. (Premise. The Weak Part-Whole Thesis)
6. (From 4, 5) So, probably, no parts of a semi-living being which do not constitute the whole being can have as much intrinsic value as the being itself has.
7. If Gaia and all creatures on it constitute a semi-living being, then all Earthbound human beings are parts of a semi-living being while at the same time they do not constitute that whole being: namely, Gaia and all creatures on it. (Premise)
8. (From 1, 2, 3) So Gaia theory implies that Gaia and all creatures on it constitute a semi-living being.
9. (From 7, 8) So Gaia theory implies that all Earthbound human beings are parts of a semi-living being while at the
same time they do not constitute that whole being: namely, Gaia and all creatures on it.
10. (From 6, 9) So Gaia theory implies that, probably, all Earth-bound human beings do not have as much intrinsic value as Gaia and all creatures on it. (The Lesser Value Thesis)
11. Anthropocentrism implies that Earthbound human beings as a whole have as much intrinsic value as the Earth and all creatures on it. (From definition of anthropocentrism)
12. (From 10, 11) Therefore, Gaia theory implies that it is probable that anthropocentrism is false. (The Moderate Kibosh Thesis)

6. ANATOMY OF THE ARGUMENT.

Such are the argument’s bare bones. Let us incarnate them one by one.

We begin with the first premise. This claims the theory implies that Gaia has many properties which are often thought crucial to living beings. These properties are: being self-sustaining, having metabolism, having parts with functions, being autopoietic, being homeostatic, behaving so as to reveal some sort of purposiveness, and being closed to efficient causation from without. To support this premise, I need to show that the theory implies that Gaia has all these properties. So let us take them one by one.

Take self-sustenance first. Since Gaia theory claims that Gaia is self-organizing and self-regulating, it implies that Gaia is self-sustaining.

Metabolism, in turn, is that process by which a physical object maintains a roughly fixed form while its micro-level component parts are constantly changing, where it maintains this fixed form by replacing these component parts with quite similar entities (cp. Maynard Smith 1986, 1; cp. Margulis and Sagan 1995, 23). For example, a human being undergoes metabolism in that it retains a roughly fixed form even while the molecules composing it are constantly changing. The theory seems to imply that Gaia metabolizes because of its stress on Gaia’s self-regulation, especially in G2’s claim that Gaia regulates the composition of the Earth’s surface, and in G6’s description of the feedback process whereby particular periods of self-regulation occur.

Turn then to having parts with functions. Let us say, following Larry
Wright’s influential analysis, that the function of \( X \) is \( Y \) just in case (1) \( X \) is there because it does \( Y \) and (2) \( Y \) is a consequence of \( X \)’s being there (Wright 1976, 81). Now take what Gaia theory would call a part of Gaia: the inner atmosphere with its peculiar acidity-alkalinity (see G1 and G2). On the theory, the inner atmosphere with that acidity-alkalinity is there because it makes possible the homeostasis of Gaia’s climate and chemical composition (compare G2 and G3). Just so, Gaia’s homeostasis is a consequence of the existence of the inner atmosphere with its peculiar acidity-alkalinity; without the latter, Gaia’s climate would not be homeostatic. So the inner atmosphere with its peculiar acidity-alkalinity is a functional part of Gaia. Hence Gaia theory implies that Gaia has parts with functions.

Let us then take autopoiesis. An entity is autopoietic just in case it has a certain fixed form which it manifests through most of its existence, where it assumes this form largely because of the occurrence of processes internal to itself, and where it retains this form largely because of the occurrence of such processes (Maturana and Varela 1988, 43, 47; Margulis and Sagan 1995, 23). In short, autopoiesis is self-production combined with self-maintenance. For example, take a poodle. It has a fixed form, the form of an adult poodle, which it manifests through most of its existence. It assumes this form largely by processes internal to itself, namely the gene-driven development of its body. Finally, it retains this form largely by processes internal to itself: instincts of self-preservation, capacities for replacing tissue, nerves, and skin, etc. Now Gaia theory claims that Gaia’s own processes keep the Earth’s surface composition regulated (see G2), that Gaia’s self-regulation process keeps the Earth’s composition homeostatic (see G4), and that Gaia acquired the self-regulation capacity through evolution driven by the interaction of the evolving biota and the Earth’s changing surface environment (see G5). Hence the theory seems to imply that Gaia as a self-regulating system is self-producing and self-maintaining, and thus autopoietic.

Homeostasis is next. G4 explicitly attributes this property to Gaia, so the theory clearly implies that Gaia is homeostatic.

Let us then take purposive behavior. We may say that an entity behaves purposively if it either (a) acts on the basis of intentions, or (b) does things which contribute to its self-maintenance. Gaia theory’s attribution of self-regulating behavior to Gaia, and its claim that this behavior per-
mits homeostasis, clearly satisfies criterion (b). Hence the theory implies that Gaia behaves purposively.

Take finally being closed to external efficient causation. We may say, following Robert Rosen, that a system is closed to efficient causation from outside itself just in case, if \( f \) is any component of that system, the question “why \( f? \)” often has a good answer within the system, that is, the operations of some other part or parts of the system give a good answer to that question (Rosen 1991, 244).\(^{25}\) Now take Gaia as a self-regulating system. If we ask why Gaia has the acidity-alkalinity it does, a good answer is, according to Gaia theory, that it has that acidity-alkalinity because of a complicated feedback process among Gaia’s biota and its physical environment. And the same story could be told, on Gaian principles, about many of Gaia’s components. So the theory seems to imply that Gaia is largely closed to external causation. Many of its important features are the result of internal causal processes.

We have thus shown that Gaia theory implies that the Earth with all creatures on it is self-sustaining, has metabolism, has parts with functions, is autopoietic, is homeostatic, has behavior which reveals some sort of purposiveness, and is closed to efficient causation from without. These, as I have said, are often taken to be sufficient conditions for being an organism, about which more anon. But notice what the premise does not say. It does not say that Gaia theory implies that the Earth and all creatures on it constitute an organism or living being. For the premise makes Gaia theory too strong; it makes it such that the majority of life scientists would reject the theory, usually on the following grounds. Something counts as a living being only if it is (a member of a class most members of which are) self-reproducing, i.e. capable of producing beings much like itself (Crick 1981, 49–62; Küppers 1985, 9; Mayr 1982, 53, Monod 1971, 12; Poundstone 1985, 191). But since the Earth and all creatures on it evidently do not self-reproduce, Gaia cannot count as a living being or organism (Sterelny and Griffiths 1999, 358).

Faced with such objections, Lovelock and the theory’s co-founder, Lynn Margulis, have regularly insisted that the theory does not imply that Gaia is an organism (Lovelock 2004, 2; 2006, 16; Margulis 1998, 119, 123).\(^{26}\) All their presentations of the theory, they maintain, have claimed only that Gaia should be seen as significantly like an organism—no presentation has claimed that Gaia is literally an organism. The claim is meta-
phorical only, and this is legitimate, since metaphors have an important place in the progress of scientific inquiry (cf. Hesse 1980). Hence the theory should not be interpreted to imply that Gaia is literally a living being, in any scientifically well-motivated sense of “living being.” The theory remains agnostic on this question. Hence the implication that Gaia is a living being is blocked. If this is right, then we should add another main claim to our specification of Gaia theory, namely:

G13. The theory presented in the preceding 12 claims should not be interpreted to imply that Gaia is literally a living being, in any scientifically well-motivated sense of “living being.” The theory remains agnostic on this question.

That, then, is what the premise does and does not say, as well as the reasons supporting it.

Turn then to the second premise. This holds that several scientifically well-motivated definitions of “living being” maintain that any being which has all the properties mentioned in the last premise counts as a living being. The definitions I have in mind are due to John Maynard Smith, Humberto Maturana and Francisco Varela, Robert Rosen, and Lynn Margulis and Dorion Sagan. Maynard Smith, an eminent biological theorist, has maintained that a being counts as a living being if it undergoes metabolism and has parts with functions that contribute to the being’s survival (Maynard Smith 1986, 1). Maturana and Varela, distinguished life scientists, have argued that a being counts as living if it is autopoietic (Maturana and Varela 1988, 43). Rosen, a mathematical biologist, presents a precisely-reasoned case for the view that a system is alive just in case it is closed to efficient causation from outside itself (Rosen 1991, 244). And the eminent all-around biologist Margulis and science writer Sagan suggest that a being counts as living if it is a system that is autopoietic, metabolic, and closed to causation from without (Margulis and Sagan 1995, 23). From all this, we may conclude that several scientifically well-motivated definitions of “living being” maintain that any being with the following properties counts as a living being: is self-sustaining, has metabolism, has parts with functions, is autopoietic, is homeostatic, has behavior which reveals some sort of purposiveness, and is closed to efficient causation from without. So we have supported the premise.

Now it might be objected, against this premise, that a claim cannot...
be scientifically well-motivated if there is a scientific consensus against it, and that there is such a consensus against these definitions. For the majority of scientific definitions of living being make self-reproduction a necessary condition for life. Definitions making self-reproduction such a necessary condition have been offered by Francis Crick, Bernd-Olaf Küppers, Ernst Mayr, Jacques Monod, and William Poundstone, among many others (Crick 1981, 49–62; Küppers 1985, 9; Mayr 1982, 53; Monod 1971, 12; Poundstone 1985, 191). The trouble here, though, is that this necessary condition runs afoul of an obvious counterexample: populations like mules and ligers whose members cannot reproduce with one another, because all the males are infertile (a liger is a cross between a male lion and a female tiger). Yet surely these are living beings. So self-reproduction cannot be a necessary condition for organismhood. So insofar as there is a consensus in favor of making self-reproduction necessary for organismhood, that consensus appears to be wrongheaded.

The argument’s next step stipulates a definition. It proposes that we call “a semi-living being” any being with features such that several scientifically well-motivated definitions of “living being” would maintain that it is a living being.

The next premise, which is numbered 4 in the argument-schema, holds that no parts of a living being that do not constitute the whole being can have as much intrinsic value as the being itself has. This is the Part-Whole Thesis, which is one of the two key moves in the argument. The idea in the Thesis is this. Think of any living being you please: a horse, a chestnut tree, a bacterium, a lichen, or a human being. On the Thesis, no parts of this living being, however many parts they may be, can have as much intrinsic value as the being itself has, so long as at least one part is left out. For example, take all the parts of a given Percheron draft horse, save its right front hoof. Call them “Parts-minus-hoof.” On the Thesis, Parts-minus-hoof cannot have as much intrinsic value as the Percheron itself. (If we added the right front hoof to Parts-minus-hoof, the resulting combination might equal the Percheron’s intrinsic value; but that is neither here nor there.)

Now against the Thesis, the following objection might be made. Consider the case of a human amputee. Surely she has just as much intrinsic value as she did before her amputation. But then it seems that parts of a living being which do not constitute the whole being (the amputee post-
amputation) can have as much intrinsic value as the whole being (the amputee pre-amputation). So the Thesis seems false.

The reply to this is that the Part-Whole Thesis applies only when the whole being and a proper subset of its parts are considered at the same time. Strictly speaking, the Thesis should read

Strict Part-Whole Thesis: No things which at time $t$ are parts of a living being but do not, at $t$, constitute the whole being as it is at $t$, can have as much intrinsic value at $t$ as the being itself has at $t$.

So the alleged counterexample does not apply, since in its scenario the amputee is taken from time $t+1$, whereas the whole being (i.e., the person before her amputation) is taken from $t$. If that is right, then it looks like there are decent reasons for accepting the Thesis.

With the Part-Whole Thesis in hand, we turn to premise 5, which is the argument’s second key move. This premise presents an implication of the Part-Whole Thesis. It holds that if that thesis is true, then, probably, no parts of a semi-living being that do not constitute the whole being can have as much intrinsic value as the being itself has. I defend this premise as follows. Any being which several scientifically well-motivated definitions of living being would count as living is probably a living being. So then it is probable that whatever holds true of any living being holds true of a plausible living being. Thus the premise.

The next premise comes under number 7 in the argument-schema. It holds that if Gaia and all creatures on it constitute a semi-living being, then all Earthbound human beings are parts of a semi-living being while at the same time they do not constitute that whole being—namely, Gaia and all creatures on it. This premise follows from the definition of Gaia given by G1.

The last premise comes under number 11 in the argument-schema. It holds that anthropocentrism implies that Earthbound human beings as a whole have as much intrinsic value as the Earth and all creatures on it. This premise is a consequence of our definition of anthropocentrism, which again holds that it is the view that the only things valuable in themselves are: human beings; their desires, needs, and purposes; and the satisfaction of those.

From these premises and definitions, we can make a series of simple inferences, which fall under numbers 6, 8, 9, 10, and 12 in the argument-
schema. These inferences yield the conclusion that Gaia theory implies that it is probable that anthropocentrism is false. We may call this “the Moderate Kibosh Thesis.” So we have obtained, by what I take to be a strong argument, a modest version of the Kibosh Thesis. If the argument holds good, then it appears that the truth of Gaia theory would make it more probable than not that anthropocentrism is false. So accepting Gaia theory would give you a strong reason for rejecting anthropocentrism.

7. CLOSING.

I have argued for the Moderate Kibosh Thesis, the view that if Gaia theory is true, then it is likely that anthropocentrism is false, and thus that the kibosh is put on anthropocentrism. If my argument is right, then Gaia theory makes 13 main claims, which I laid out in Parts 2 and 6. Again, if my argument is right, then we should reject any scientific consensus to the effect that a being cannot be alive if it lacks the capacity for self-reproduction. And if the overall thrust of the argument is right, then a debate in metaethics—which beings have intrinsic value?—may turn on the fortunes of a scientific theory and debates over how to define living beings.

Of course, my inquiry here broaches more questions than it stops. The first and most obvious is whether I am right in claiming that Gaia theory centers on the 13 claims I have attributed to it. Might it rather be that these claims are constitutive of only one version of Gaia theory? Might there be other, legitimate versions of the theory, which accept some but not all of these 13 claims? Has Gaia theory a deep structure composed of a smaller number of claims? Second, what explains the evident truth of the Part-Whole Thesis? How is it possible that no parts of a living being that do not constitute the whole being can have as much intrinsic value as the being itself has? Third, what other ethical and political implications does Gaia theory have? Does it have as wide-ranging implications for our ethical and social thinking as the theory of evolution by natural selection? Fourth, since the argument to the Kibosh Thesis turns on the claim that human beings are part of the Earth system, what implications would a permanent human migration to other planets have for the Thesis? These are only some of the questions that arise when we consider the claims of anthropocentrism and Gaia theory.
NOTES

1. For Smith’s objection to the Thesis, see Smith 1991, 150–51. Dobson argues that the Greens can argue from Gaia theory to the falsity of anthropocentrism only by either recasting Gaia theory or by smuggling in anthropocentrism premises. So on Dobson’s view, to refute anthropocentrism by appeal to Gaia, the Greens must either reject Gaia theory or contradict themselves. See Dobson 1995, 45–47. For Hayward’s skepticism about the inference, see Hayward, 1994, 32–33.


3. See also the following from Lovelock 1995, 213: “By 1988 Gaia had proved its worth by initiating a new study of Earth’s atmosphere and climate...In its testing, Gaia theory had already opened several new fields of research, each with its own literature.” Quoted in Belshaw 2001, 288.

4. The 2001 Amsterdam Declaration was promulgated after the meeting of four organizations researching global change: the International Geosphere Biosphere Programme, the International Human Dimensions Programme on Global Environmental Change, the World Climate Research Programme, and the International Biodiversity Programme. See Lovelock 2004, 3.


6. However, Lynn Margulis implies in one of her writings that Gaia is only the sum of life on Earth, not including the Earth’s surface itself. See Margulis 1998, 119, and compare the seemingly contradictory claims on p. 120.

7. On the definition of homeostasis, see Wilkinson 2004, 71.


9. On ultimate explanations, and their differences from what are called “proximate explanations,” see Mayr 1988, 28.


11. On proximate explanations, and their differences from ultimate explanations, see Mayr 1988.

12. See also the first of the list of important tenets of Gaia theory in Lenton 2004, 17. On the interlinked evolution of life and environment, see Kooijman 2004.
13. It seems, however, that not all Gaia scientists would accept this reconstruction of the theory. See, for example, the list of four important tenets of Gaia theory in Lenton 2004, 17. Lenton’s list strikes me as inconsistent with what Lovelock presents as the theory’s main claims.


16. Note further that this does not require that conditions be kept favorable for all contemporary life. Just most of it.

17. Indeed, Janna Thompson has suggested that all work in environmental ethics, properly speaking, rejects anthropocentrism. See Thompson 1990. Thompson’s claim runs into trouble for failing to distinguish adequately between environmental ethics (the field of research dealing with ethical problems concerning the environment) and an environmental ethic (a moral viewpoint making specific claims about how we ought to treat the environment). Still, she is right in claiming that most workers in the field of environmental ethics reject anthropocentrism out of hand.

18. This is the best I can do at reconstructing the argument for the implication in Routley and Routley 1995, 127.


20. This is a compressed statement of Mackie’s argument from queerness against objective values. See Mackie 1977, 38–42.

21. For further discussion of the nature of plans, see Bratman 1999.

22. It bears noting that this anthropocentric criterion seems to satisfy the three adequacy conditions laid down in Routley and Routley 1995, 108. The criterion proposes a set of characteristics which seem (1) to be possessed by at least all properly functioning humans, (2) not to be possessed by any non-human, and (3) sufficient to justify, in a non-circular way, the cut-off of [full-blooded] moral consideration at exactly the right point.

23. Though some have suggested that non-human great apes may come close to satisfying these three conditions. See the relevant papers collected in Cavalieri and Singer, eds. 1994.

24. For discussion of this analysis, see Godfrey-Smith 1993. For a critical survey of different conceptions of function, see Sterelny and Griffiths 1999, 220–24.

25. I have weakened Rosen’s definition given there by introducing “often.” Without that, the definition seems too strong. Not all components of a human being—a living system—have a good explanation within the system. A man who lacks half a hand because he lost it in an industrial accident has a component whose explanation comes from outside the system.

26. To be sure, Lovelock does sometimes seem to claim that Gaia is literally a living being; see Lovelock 1988, 8, 27.
28. Belshaw seems to think that this is a good rule for interpreting Gaia theory, though I doubt he thinks it a core claim of the theory itself. See the discussion of the living being metaphor in Belshaw 2001, 287.

REFERENCES


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