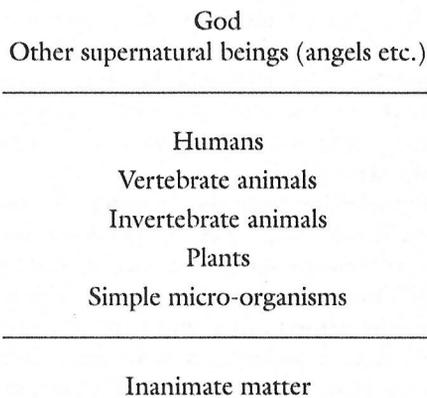


## Introduction

Anthropocentrism is a worldview which places humans, figuratively if not literally (in the case of geocentric astronomy) at the center of the cosmos. Philosophically, anthropocentrism can be parsed into five interconnected themes.

First, anthropocentrists typically see the natural order as arranged in a grand hierarchy (a “Great Chain of Being”).<sup>1</sup> In this ranking, humans hold a coveted position, above all other biota and just below supernatural beings such as angels and God, something like this:



This idea is no better stated than by the medieval philosopher Thomas Aquinas:

[A] wonderful chain of beings is revealed to our study. The lowest member of the higher genus is always found to border upon the highest member of the lower genus. Thus some of the lowest members of the genus of animals attain to little beyond the life of plants, certain shellfish for instance, which are motionless, have only the sense of touch, and are attached to the ground like plants.<sup>2</sup>

Humans are on a borderline between the supernatural and the natural, just below God and angels: The human soul “is said to be on the horizon and boundary line between things corporeal and incorporeal, inasmuch as it is an incorporeal substance and at the same time the form of a body.”<sup>3</sup>

Second, connected to the idea that humans inhabit a special position at the very top of the natural order, just shy of divinity, is the notion of a firm ontological

divide between human and nonhuman nature (metaphysical dualism). This divide is expressed by such familiar dualisms as culture/nature and mind/body or soul/body. Anthropocentrists often cite the possession of an immaterial soul lodged in a material body as evidence of dualism (as does French philosopher René Descartes).

Third, aligned with this dualism is the idea of nature-as-machine (mechanism) – nature as a system of inanimate particles rather than as inherent Aristotelian forces.<sup>4</sup> This system operates deterministically according to the mathematical laws of physics. According to Descartes and English mathematician and physicist Isaac Newton, even biota are mechanistic.<sup>5</sup> Human beings, graced with free will, are exempt from these laws.

Fourth, anthropocentrists hold the position that human beings alone are intrinsically valuable (good in and of ourselves) and that nonhuman nature is valuable only insofar as it has use-value for humans (good instrumentally for our ends). This instrumental valuation of nature is epitomized by the view of nature as economic resource (resourcism), articulated most prominently by the English philosopher John Locke.<sup>6</sup>

Fifth, anthropocentrists maintain that human beings constitute, solely and exclusively, the moral community. This position is founded on the two foregoing points: the class of entities worthy of moral considerability is separate from nature, and only humans are intrinsically valuable and hence worthy of moral consideration.

In the first reading in this section, from *The Summa Contra Gentiles*,<sup>7</sup> Aquinas develops the ethical implications of the Great Chain of Being. In the Great Chain of Being, humans are closest to the likeness of God. Rational creatures exercise free will (that is, have dominion over their actions). God bestows on such creatures (namely, human beings) intrinsic value. The actions of other organisms are causally determined by the environment, making them “slaves” to their surroundings. Because beings higher in the hierarchy manifest more fully the work and glory of God than beings lower down, and humans are at the top of the natural order, human beings alone are morally considerable. Moreover, human beings have the right to subjugate beings

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below. Animals who do not exercise free will (dumb animals) can be used and killed for human ends in accordance with the will of God. Anticipating Kant, Aquinas argues that the only danger in killing dumb animals is that such behavior might lead to cruelty to other human beings.

For English philosopher Francis Bacon (1561–1626 CE), the focus of knowledge should not be abstract, immaterial, Platonic Forms, but the material improvement of the human condition. As he writes in the selection from *The Great Instauration*, this focus enjoins the mastery (command) of nature. The value of nature is as resource for human purposes. The method of manipulating the operations of nature for human ends is to carve nature at its joints in order to see what parts nature is made of and how they are put together (reductionism).

French philosopher René Descartes (1596–1650 CE) gave an honest application of the mechanical view of nature to biota. In the estimation of American biologist Ernst Mayr, perhaps no one “contributed more to the spread of the mechanistic world picture than ... Descartes.”<sup>8</sup> In the *Discourse* and in personal correspondence, Descartes argues that (1) either nonhuman animals are utterly devoid of sentience or they have human-like sentience; (2) nonhuman animals do not have human-like sentience; (3) therefore nonhuman animals are utterly devoid of sentience. Nonhuman animals are, in a word, machines – albeit incredibly complex biological machines, the handiwork of God, but machines nonetheless. If nonhuman organisms are mere machines, then they cannot be the object of moral consideration any more than can a clock or an engine. Kant would take up the issue of moral duties to nonhumans more than a century later, and arrive at a slightly different conclusion.

Bacon and Descartes were part of a trend during the modern period in championing the mechanical view of nature. Nature, on this metaphysics, operates according to mathematical and deterministic laws of physics. This includes *all* natural motions (including those of living things). English mathematician and physicist Isaac Newton (1642–1727 CE) elaborates the mechanical view in the *Principia*:

For the basic problem of philosophy seems to be to discover the forces of nature from the phenomena of motions and then to demonstrate the other phenomena from these forces ... by means of propositions demonstrated mathematically[.] [W]e derive

from celestial phenomena the gravitational forces by which bodies tend toward the sun and toward the individual planets. Then the motions of the planets, the comets, the moon, and the sea are deduced from these forces by propositions that are also mathematical. If only we could derive the other phenomena of nature from mechanical principles by the same kind of reasoning! For many things lead me to have a suspicion that all phenomena may depend on certain forces by which the particles of bodies, by causes not yet known, either are impelled toward one another and cohere in regular figures, or are repelled from one another and recede. Since these forces are unknown, philosophers have hitherto made trial of nature in vain. But I hope that the principles set down here will shed some light on either this mode of philosophizing or some other truer one.<sup>9</sup>

If we knew the details of the initial conditions and vectors of all natural motion (organic things included) as we do celestial bodies, then we ought to be able to calculate their motions (organic growth included) with mathematical certainty based on mechanical principles.

In the selection from the *Opticks* presented here, Newton derides two of Aristotle’s four causes<sup>10</sup> – formal and final causation – as “occult qualities.” By “occult” Newton means that those causes have no place in the natural order, and that all natural phenomena can be understood in terms of Aristotle’s two other causes – material and efficient causation. The study of material and efficient causation is the methodology of the mechanical view. Newton claims that God operates all parts of nature by mechanical principles, just as humans move parts of our bodies.

In his essay “Nature,” English philosopher John Stuart Mill (1806–73 CE) considers the multiple meanings of the word “nature,” a topic taken up in the introductory essay of this volume, “What is Environmental Ethics?” Mill observes that “nature” might mean “aggregate ... sum of all phenomena” and “everything which happens ... without the agency of man” – that is, natural as opposed to the artificial. There is a third teleological meaning, the inner essence of a thing, which Mill casts in a normative light as per natural law theory. In this third sense, “nature” provides a prescriptive standard for human conduct, and in this third sense Mill finds fault. Nature is destructive and ought not to be used as a standard for human conduct. Rather, as Bacon argued, humans should ameliorate the flaws of nature by tinkering with its workings.

It is worth noting that Holmes Rolston echoes Mill in his environmental ethics of hierarchical (anthropometric) biocentrism. Rolston contends that nature itself is amoral:

Nature proceeds with a recklessness that is indifferent to life; this results in senseless cruelty and is repugnant to our moral sensitivities. Life is wrested from her creatures by continual struggle, usually soon lost; those few who survive to maturity only face eventual collapse in disease and death. With what indifference nature casts forth her creatures to slaughter! Everything is condemned to live by attacking or competing with other life. There is no altruistic consideration of others, no justice.<sup>11</sup>

For Mill, as for Rolston, nature will not suffice as a template for intra-human ethics.

If you believe that there is no formal and final causation outside of nature and that natural process consists wholly of material and efficient causation, that nature is a colossal Machine ticking according to the deterministic laws of physics (mechanism), then you are likely to see no value in nature besides resource value. This view is “resourcism,” influentially summarized by English philosopher John Locke (1632–1704 CE) in his essay “Of Property.” Locke conjectures that God gave humankind the Earth in common for use as a natural resource.<sup>12</sup> God also gave humans rationality so that we can make the “best advantage” of this gift.<sup>13</sup> Each individual “owns” his or her body, and labor is a function of the body. By extension, the fruits of labor are also owned by the working individual. Once one exerts one’s labor on the inert pool of natural resources to make them advantageous to human well-being – by clearing forest, moving rocks, plowing soil, planting crops – one is entitled to the products of that labor: “Whatsoever, then, he removes out of the state that Nature hath provided and left it in, he hath mixed his labour with it, and joined to it something that is his own, and thereby makes it his property.”<sup>14</sup>

This is the essence of the Western notion of private property. It is based on the fundamental assumption that the value of natural resources is latent in that the resources must be actualized by human labor to become valuable, but only of instrumental value. Natural resources have no intrinsic value. Human beings, through labor, transform the latent resource value into useful products.

Gifford Pinchot (1865–1946), the first chief of the US Forest Service and later Governor of Pennsylvania, would apply Lockean resourcism to twentieth-century American land-use policy. He saw “just two things on this material earth – people and natural resources.”<sup>15</sup> From this ontology, Pinchot adduced the environmental policy of conservationism:

The first great fact about conservation is that it stands for development. ... Conservation does mean provision for the future, but it means also and first of all the recognition of the right of the present generation to the fullest necessary use of all the resources with which this country is so abundantly blessed. Conservation demands the welfare of this generation first, and afterward the welfare of the generations to follow. ... In the second place conservation stands for the prevention of waste.<sup>16</sup>

It is wrong to let natural resources lie fallow, their latent value unactualized. The thinking of Pinchot and Locke is behind an argument heard against wilderness designation throughout the western United States: developers should “release” as much value from the land as possible through development and not let those resources remain unutilized, locked away in “wilderness.”<sup>17</sup>

In our selection from *Lectures on Ethics*, Immanuel Kant (1724–1804 CE) takes up the issue of moral duties to nonhuman nature addressed previously by Aquinas and Descartes. Kant agrees with both predecessors that humans have no *direct* duties to nonhumans. Only rational beings are worthy of moral considerability (ratiocentrism) and only human beings are rational.<sup>18</sup> Kant, however, thought that there is an anthropocentric rationale for *indirect* duties to both inanimate and animate nonhuman nature.

Kant thinks there is a behavioral connection between habits regarding the treatment of human beings and nonhuman nature. The way one treats nonhuman animals, for example, will likely affect the way one treats fellow humans, “for he who is cruel to animals becomes hard also in his dealing with men.”<sup>19</sup> So if you sizzle ants under a magnifying glass using the rays of the sun for fun, if you shoot squirrels hopping along branches from your porch while drinking whisky for evening entertainment, if you take cats out in the middle of a lake and throw them overboard to watch them panic, flail, and drown, or if you wire a coyote to a fence to let it die slowly of starvation and dehydration and exposure in

retribution for killing sheep,<sup>20</sup> a Kantian ethicist would say that these actions are not morally repugnant in-and-of themselves because these nonhuman animals lack rationality and hence cannot be the proper objects of moral considerability. But these actions could help foster habits of cruelty which ultimately might result in you hurting a human being for which you *would* be morally culpable. Take the example of the 7-year-old boy in Australia who broke into a zoo before opening hours. Caught on video cameras sporting a big grin, the boy tossed live reptiles into the jaws of a huge crocodile and bludgeoned three lizards to death in their pens.<sup>21</sup> It does not require a big stretch of the imagination to think that this is the kind of kid who later in life would be an assailant or murderer.

In the final selection of this section, Wilfred Beckerman (an economist) and Joanna Pasek (a philosopher) give a contemporary defense of anthropocentrism, which in many ways parallels the anthropocentric environmental philosophy of Bryan Norton. Beckerman and Pasek argue that, despite the most energetic exertions of nonanthropocentrists intent upon outlining an objectivist axiology of intrinsic value in nature, anthropocentrism is inevitable because all interpretations of nature will always be rooted in a human-centered perspective. Therefore, even "nonanthropocentrism" is anthropocentric.

Environmental ethics must be understood within the context of the Western intellectual tradition. As illustrated in these readings, most great philosophers advanced an anthropocentric agenda by touching on one or more of the five defining features of anthropocentrism. Environmental ethics is to be understood as a set of critiques, some commendatory but most condemnatory, of the anthropocentric worldview.

## Notes

- 1 See Lovejoy's classic work on this subject, *The Great Chain of Being*.
- 2 Aquinas, *Summa Contra Gentiles*, Carroll Press edn., p. 133.
- 3 Ibid.
- 4 See Merchant, *The Death of Nature*, p. 193. (See this volume, p. 299.)
- 5 Descartes, February 5, 1649, letter to More, *The Philosophical Writings of Descartes*, vol. 3, pp. 365–6; Newton, *The Principia*, pp. 382–3.
- 6 "Of Property," *Second Treatise of Government*, in Laslett, ed., *Two Treatises of Government*, pp. 285–302.
- 7 This reading selection is taken from the Burns, Oates & Washbourne edition.
- 8 Mayr, *The Growth of Biological Thought*, p. 97.
- 9 Newton, *The Principia*, pp. 382–3.
- 10 *Metaphysics* Book V, in McKeon, ed., *The Basic Works of Aristotle*, p. 752.
- 11 Rolston, *Environmental Ethics*, p. 39.
- 12 "Of Property," *Second Treatise of Government*, in Laslett, ed., *Two Treatises of Government*, §25, p. 286. (See this volume, p. 77.)
- 13 Ibid., §26, p. 286. (See this volume, p. 77.)
- 14 Ibid., §27, p. 288. (See this volume, p. 78.)
- 15 Pinchot, *Breaking New Ground*, p. 325.
- 16 *The Fight for Conservation*, pp. 42, 44.
- 17 See e.g. Baum, "Wise Guise."
- 18 Kant's ratiocentrism implies that nonrational human beings are not worthy of moral consideration – a problem latched onto by animal welfare theorists. See, e.g., Regan, "An Examination and Defense of One Argument Concerning Animal Rights." Cf. also p. 10.
- 19 Kant, *Lectures on Ethics*, Century edn., p. 240. (See this volume, p. 82.)
- 20 Evidence suggests that each one of these things has actually occurred.
- 21 Cavanagh, "Boy, 7, Feeds Live Zoo Animals to Croc."

# I Humans as Moral Ends

## *Thomas Aquinas*

THAT RATIONAL CREATURES ARE GOVERNED FOR THEIR OWN SAKE, AND OTHER CREATURES, AS DIRECTED TO THEM

In the first place then, the very condition of the rational creature, in that it has dominion over its actions, requires that the care of providence should be bestowed on it for its own sake: whereas the condition of other things that have not dominion over their actions shows that they are cared for, not for their own sake, but as being directed to other things. Because that which acts only when moved by another, is like an instrument; whereas that which acts by itself, is like a principal agent. Now an instrument is required, not for its own sake, but that the principal agent may use it. Hence whatever is done for the care of the instruments must be referred to the principal agent as its end: whereas any such action directed to the principal agent as such, either by the agent itself or by another, is for the sake of the same principal agent. Accordingly intellectual creatures are ruled by God, as though He cared for them for their own sake, while other creatures are ruled as being directed to rational creatures.

Again. That which has dominion over its own act, is free in its action, because *he is free who is cause of himself*:<sup>1</sup> whereas that which by some kind of necessity is moved by another to act, is subject to slavery. Therefore every other creature is naturally under slavery; the intellectual nature alone is free. Now, in every government provision is made for the free for their own sake; but for slaves that they may be useful to the free. Accordingly divine providence makes provision for the intellectual creature for its own sake, but for other creatures for the sake of the intellectual creature.

Moreover. Whenever certain things are directed to a certain end, if any of them are unable of themselves to attain to the end, they must needs be directed to those that attain to the end, which are directed to the end for their own sake. Thus the end of the army is victory, which the soldiers obtain by their own action in fighting, and they alone in the

army are required for their own sake; whereas all others, to whom other duties are assigned, such as the care of horses, the preparing of arms, are requisite for the sake of the soldiers of the army. Now, it is clear from what has been said, that God is the last end of the universe, whom the intellectual nature alone obtains in Himself, namely by knowing and loving Him, as was proved above. Therefore the intellectual nature alone is requisite for its own sake in the universe, and all others for its sake.

Further. In every whole, the principal parts are requisite on their own account for the completion of the whole, while others are required for the preservation or betterment of the former. Now, of all the parts of the universe, intellectual creatures hold the highest place, because they approach nearest to the divine likeness. Therefore divine providence provides for the intellectual nature for its own sake, and for all others for its sake.

Besides. It is clear that all the parts are directed to the perfection of the whole: since the whole is not on account of the parts, but the parts on account of the whole. Now, intellectual natures are more akin to the whole than other natures: because, in a sense, the intellectual substance is all things, inasmuch as by its intellect it is able to comprehend all things; whereas every other substance has only a particular participation of being. Consequently God cares for other things for the sake of intellectual substances.

Besides. Whatever happens to a thing in the course of nature happens to it naturally. Now, we see that in the course of nature the intellectual substance uses all others for its own sake; either for the perfection of the intellect, which sees the truth in them as in a mirror; or for the execution of its power and development of its knowledge, in the same way as a craftsman develops the conception of his art in corporeal matter; or again to sustain the body that is united to an intellectual soul, as is the case in man. It is clear, therefore, that God cares for all things for the sake of intellectual substances.

<sup>1</sup>From *The Summa Contra Gentiles*, Part II, Book 3, Chapter CXII (London: Burns, Oates & Washbourne Ltd., 1928), pp. 88-92.

Moreover. If a man seek something for its own sake, he seeks it always, because *what is per se, is always*: whereas if he seek a thing on account of something else, he does not of necessity seek it always but only in reference to that for the sake of which he seeks it. Now, as we proved above, things derive their being from the divine will. Therefore whatever is always is willed by God for its own sake; and what is not always is willed by God, not for its own sake, but for another's. Now, intellectual substances approach nearest to being always, since they are incorruptible. They are, moreover, unchangeable, except in their choice. Therefore intellectual substances are governed for their own sake, as it were; and others for the sake of intellectual substances.

The fact that all the parts of the universe are directed to the perfection of the whole is not in contradiction with the foregoing conclusion: since all the parts are directed to the perfection of the whole, in so far as one part serves another. Thus in the human body it is clear that the lungs belong to the body's perfection, in that they serve the heart: wherefore there is no contradiction in the lungs being for the sake of the heart, and for the sake of the whole animal. In like manner that other natures are on account of the intellectual is not contrary to their being for the perfection of the universe: for without the things required for the perfection of the intellectual substance, the universe would not be complete.

Nor again does the fact that individuals are for the sake of the species militate against what has been said. Because through being directed to their species, they are directed also to the intellectual nature. For a corruptible thing is directed to man, not on account of only one individual man, but on account of the whole human species. Yet a corruptible thing could not serve the whole human species, except as regards its own entire species. Hence the order whereby corruptible things are directed to man, requires that individuals be directed to the species.

When we assert that intellectual substances are directed by divine providence for their own sake, we do not mean that they are not also referred to God

and for the perfection of the universe. Accordingly they are said to be provided for on their own account, and others on account of them, because the goods bestowed on them by divine providence are not given them for another's profit: whereas those bestowed on others are in the divine plan intended for the use of intellectual substances. Hence it is said (Deut. iv. 19): *Lest thou see the sun and the moon and the other stars, and being deceived by error, thou adore and serve them, which the Lord thy God created for the service of all the nations that are under heaven:* and (Ps. viii. 8): *Thou hast subjected all things under his feet, all sheep and oxen: moreover, the beasts also of the field:* and (Wis. xii. 18): *Thou, being master of power, judgest with tranquillity, and with great favour disposest of us.*

Hereby is refuted the error of those who said it is sinful for a man to kill dumb animals: for by divine providence they are intended for man's use in the natural order. Hence it is no wrong for man to make use of them, either by killing or in any other way whatever. For this reason the Lord said to Noe (Gen. ix. 3): *As the green herbs I have delivered all flesh to you.*

And if any passages of Holy Writ seem to forbid us to be cruel to dumb animals, for instance to kill a bird with its young;<sup>2</sup> this is either to remove man's thoughts from being cruel to other men, and lest through being cruel to animals one become cruel to human beings: or because injury to an animal leads to the temporal hurt of man, either of the doer of the deed, or of another: or on account of some signification: thus the Apostle expounds<sup>3</sup> the prohibition against *muzzling the ox that treadeth the corn.*<sup>4</sup>

## Notes

- 1 Aristotle, *Metaphysics*, Bk I, ch. 2 [982b25].
- 2 Deuteronomy xxii. 6.
- 3 1 Corinthians ix. 9.
- 4 Deuteronomy xxv. 4.

## 2 The Mastery of Nature

### *Francis Bacon*

#### i

On a given body to generate and superinduce a new nature or new natures, is the work and aim of *human power*. Of a given nature to discover the form, or true specific difference, or nature-engendering nature, or source of emanation (for these are the terms which come nearest to a description of the thing), is the work and aim of *human knowledge*. Subordinate to these primary works are two others that are secondary and of inferior mark: to the former, the transformation of concrete bodies, so far as this is possible; to the latter, the discovery, in every case of generation and motion, of the Latent Process carried on from the manifest efficient and the manifest material to the form which is engendered; and in like manner the discovery of the Latent Configuration of bodies at rest and not in motion.

#### ii

In what an ill condition human knowledge is at the present time, is apparent even from the commonly received maxims. It is a correct position that "true knowledge is knowledge by causes." And causes again are not improperly distributed into four kinds: the material, the formal, the efficient, and the final. But of these the final cause rather corrupts than advances the sciences, except such as have to do with human action. The discovery of the formal is despaired of. The efficient and the material (as they are investigated and received, that is, as remote causes, without reference to the latent process leading to the form) are but slight and superficial, and contribute little, if anything, to true and active science. Nor have I forgotten that in a former passage I noted and corrected as an error of the human mind the opinion that Forms give existence. For though in nature nothing really exists beside individual bodies, performing pure individual acts according to a

fixed law, yet in philosophy this very law, and the investigation, discovery, and explanation of it, is the foundation as well of knowledge as of operation. And it is this law, with its clauses, that I mean when I speak of *Forms*; a name which I the rather adopt because it has grown into use and become familiar.

#### iii

If a man be acquainted with the cause of any nature (as whiteness or heat) in certain subjects only, his knowledge is imperfect; and if he be able to superinduce an effect on certain substances only (of those susceptible of such effect), his power is in like manner imperfect. Now if a man's knowledge be confined to the efficient and material causes (which are unstable causes, and merely vehicles, or causes which convey the form in certain cases), he may arrive at new discoveries in reference to substances in some degree similar to one another, and selected beforehand; but he does not touch the deeper boundaries of things. But whosoever is acquainted with Forms, embraces the unity of nature in substances the most unlike; and is able therefore to detect and bring to light things never yet done, and such as neither the vicissitudes of nature, nor industry in experimenting, nor accident itself, would ever have brought into act, and which would never have occurred to the thought of man. From the discovery of Forms therefore results truth in speculation and freedom in operation.

#### iv

Although the roads to human power and to human knowledge lie close together, and are nearly the same, nevertheless on account of the pernicious and inveterate habit of dwelling on abstractions, it is safer to begin and raise the sciences from those foundations which have relation to practice, and to

let the active part itself be as the seal which prints and determines the contemplative counterpart. We must therefore consider, if a man wanted to generate and superinduce any nature upon a given body, what kind of rule or direction or guidance he would most wish for, and express the same in the simplest and least abstruse language. For instance, if a man wishes to superinduce upon silver the yellow color of gold, or an increase of weight (observing the laws of matter), or transparency on an opaque stone, or tenacity on glass, or vegetation on some substance that is not vegetable, — we must consider, I say, what kind of rule or guidance he would most desire. And in the first place, he will undoubtedly wish to be directed to something which will not deceive him in the result, nor fail him in the trial. Secondly, he will wish for such a rule as shall not tie him down to certain means and particular modes of operation. For perhaps he may not have those means, nor be able conveniently to procure them. And if there be other means and other methods for producing the required nature (beside the one prescribed) these may perhaps be within his reach; and yet he shall be excluded by the narrowness of the rule, and get no good from them. Thirdly, he will desire something to be shown him which is not as difficult as the thing proposed to be done, but comes nearer to practice.

For a true and perfect rule of operation then the direction will be *that it be certain, free, and disposing or leading to action*. And this is the same thing with the discovery of the true Form. For the Form of a nature is such that, given the Form, the nature infallibly follows. Therefore it is always present when the nature is present, and universally implies it, and is constantly inherent in it. Again, the Form is such that if it be taken away, the nature infallibly vanishes. Therefore it is always absent when the nature is absent, and implies its absence, and inheres in nothing else. Lastly, the true Form is such that it deduces the given nature from some source of being which is inherent in more natures, and which is better known in the natural order of things than the Form itself. For a true and perfect axiom of knowledge then the direction and precept will be, *that another nature be discovered which is convertible with the given nature, and yet is a limitation of a more general nature, as of a true and real genus*. Now these two directions, the one active the other contemplative, are one and the same thing; and what in operation is most useful, that in knowledge is most true.

## V

The rule or axiom for the transformation of bodies is of two kinds. The first regards a body as a troop or collection of simple natures. In gold, for example, the following properties meet. It is yellow in color; heavy up to a certain weight; malleable or ductile to a certain degree of extension; it is not volatile, and loses none of its substance by the action of fire; it turns into a liquid with a certain degree of fluidity; it is separated and dissolved by particular means; and so on for the other natures which meet in gold. This kind of axiom, therefore, deduces the thing from the forms of simple natures. For he who knows the forms of yellow, weight, ductility, fixity, fluidity, solution, and so on, and the methods for superinducing them, and their gradations and modes, will make it his care to have them joined together in some body, whence may follow the transformation of that body into gold. And this kind of operation pertains to the first kind of action. For the principle of generating some one simple nature is the same as that of generating many; only that a man is more fettered and tied down in operation if more are required, by reason of the difficulty of combining into one so many natures, which do not readily meet except in the beaten and ordinary paths of nature. It must be said however that this mode of operation (which looks to simple natures though in a compound body) proceeds from what in nature is constant and eternal and universal, and opens broad roads to human power, such as (in the present state of things) human thought can scarcely comprehend or anticipate.

The second kind of axiom, which is concerned with the discovery of the Latent Process, proceeds not by simple natures, but by compound bodies, as they are found in nature in its ordinary course. As, for instance, when inquiry is made, from what beginnings, and by what method and by what process, gold or any other metal or stone is generated, from its first menstrua and rudiments up to the perfect mineral; or in like manner by what process herbs are generated, from the first concretion of juices in the ground or from seeds up to the formed plant, with all the successive motions and diverse and continued efforts of nature. So also in the inquiry concerning the process of development in the generation of animals, from coition to birth; and in like manner of other bodies.

It is not however only to the generations of bodies that this investigation extends, but also to other motions and operations of nature. As, for instance, when inquiry is made concerning the whole course and continued action of nutrition, from the first reception of the food to its complete assimilation; or again, concerning the voluntary motion of animals, from the first impression on the imagination and the continued efforts of the spirit up to the bendings and movements of the limbs; or concerning the motion of the tongue and lips and other instruments, and the changes through which it passes till it comes to the utterance of articulate sounds. For these inquiries also relate to natures concrete or combined into one structure, and have regard to what may be called particular and special habits of nature, not to her fundamental and universal laws which constitute Forms. And yet it must be confessed that this plan appears to be readier and to lie nearer at hand and to give more ground for hope than the primary one.

In like manner the operative which answers to this speculative part, starting from the ordinary incidents of nature, extends its operation to things immediately adjoining, or at least not far removed. But as for any profound and radical operations on nature, they depend entirely on the primary axioms. And in those things too where man has no means of operating, but only of knowing, as in the heavenly bodies (for these he cannot operate upon or change or transform), the investigation of the fact itself or truth of the thing, no less than the knowledge of the causes and consents, must come from those primary and catholic axioms concerning simple natures; such as the nature of spontaneous rotation, of attraction or magnetism, and of many others which are of a more general form than the heavenly bodies themselves. For let no one hope to decide the question whether it is the earth or heaven that really revolves in the diurnal motion, until he has first comprehended the nature of spontaneous rotation.

## vi

But this Latent Process, of which I speak, is quite another thing than men, preoccupied as their minds now are, will easily conceive. For what I understand by it is not certain measures or signs or successive steps of process in bodies, which can be seen; but a

process perfectly continuous, which for the most part escapes the sense.

For instance: in all generation and transformation of bodies, we must inquire what is lost and escapes; what remains, what is added; what is expanded, what contracted; what is united, what separated; what is continued, what cut off; what propels, what hinders; what predominates, what yields; and a variety of other particulars.

Again, not only in the generation or transformation of bodies are these points to be ascertained, but also in all other alterations and motions it should in like manner be inquired what goes before, what comes after; what is quicker, what more tardy; what produces, what governs motion; and like points; all which nevertheless in the present state of the sciences (the texture of which is as rude as possible and good for nothing) are unknown and unhandled. For seeing that every natural action depends on things infinitely small, or at least too small to strike the sense, no one can hope to govern or change nature until he has duly comprehended and observed them.

## vii

In like manner the investigation and discovery of the Latent Configuration in bodies is a new thing, no less than the discovery of the Latent Process and of the Form. For as yet we are but lingering in the outer courts of nature, nor are we preparing ourselves a way into her inner chambers. Yet no one can endow a given body with a new nature, or successfully and aptly transmute it into a new body, unless he has attained a competent knowledge of the body so to be altered or transformed. Otherwise he will run into methods which, if not useless, are at any rate difficult and perverse and unsuitable to the nature of the body on which he is operating. It is clear therefore that to this also a way must be opened and laid out.

And it is true that upon the anatomy of organised bodies (as of man and animals) some pains have been well bestowed and with good effect; and a subtle thing it seems to be, and a good scrutiny of nature. Yet this kind of anatomy is subject to sight and sense, and has place only in organised bodies. And besides it is a thing obvious and easy, when compared with the true anatomy of the Latent Configuration in bodies which are thought to be of

uniform structure: especially in things that have a specific character and their parts, as iron, stone; and again in parts of uniform structure in plants and animals, as the root, the leaf, the flower, flesh, blood, and bones. But even in this kind, human industry has not been altogether wanting; for this is the very thing aimed at in the separation of bodies of uniform structure by means of distillations and other modes of analysis, – that the complex structure of the compound may be made apparent by bringing together its several homogeneous parts. And this is of use too, and conduces to the object we are seeking; although too often fallacious in its results, because many natures which are in fact newly brought out and superinduced by fire and heat and other modes of solution are taken to be the effect of separation merely, and to have subsisted in the compound before. And after all, this is but a small part of the work of discovering the true configuration in the compound body; which configuration is a thing far more subtle and exact, and such as the operation of fire rather confounds than brings out and makes distinct.

Therefore a separation and solution of bodies must be effected, not by fire indeed, but by reasoning and true induction, with experiments to aid; and by a comparison with other bodies, and a reduction to simple natures and their Forms, which meet and mix in the compound. In a word we must pass from Vulcan to Minerva, if we intend to bring to light the true textures and configurations of bodies; on which all the occult and, as they are called, specific properties and virtues in things depend; and from which too the rule of every powerful alteration and transformation is derived.

For example, we must inquire what amount of spirit there is in every body, what of tangible essence; and of the spirit, whether it be copious and turgid, or meagre and scarce; whether it be fine or coarse, akin to air or to fire, brisk or sluggish, weak or strong, progressive or retrograde, interrupted or continuous, agreeing with external and surrounding objects or disagreeing, etc. In like manner we must inquire into the tangible essence (which admits of no fewer differences than the spirit), – into its coats, its fibres, its kinds of texture. Moreover the disposition of the spirit throughout the corporeal frame, with its pores, passages, veins and cells, and the rudiments or first essays of the organised body, fall under the same

investigation. But on these inquiries also, and I may say on all the discovery of the Latent Configuration, a true and clear light is shed by the primary axioms, which entirely dispels all darkness and subtlety.

### viii

Nor shall we thus be led to the doctrine of atoms, which implies the hypothesis of a vacuum and that of the unchangeableness of matter (both false assumptions); we shall be led only to real particles, such as really exist. Nor again is there any reason to be alarmed at the subtlety of the investigation, as if it could not be disentangled: on the contrary, the nearer it approaches to simple natures, the easier and plainer will everything become; the business being transferred from the complicated to the simple, from the incommensurable to the commensurable, from surds to rational quantities, from the infinite and vague to the finite and certain, – as in the case of the letters of the alphabet and the notes of music. And inquiries into nature have the best result when they begin with physics and end in mathematics. Again, let no one be afraid of high numbers or minute fractions. For in dealing with numbers it is as easy to set down or conceive a thousand as one, or the thousandth part of an integer as an integer itself.

### ix

From the two kinds of axioms which have been spoken of, arises a just division of philosophy and the sciences; taking the received terms (which come nearest to express the thing) in a sense agreeable to my own views. Thus, let the investigation of Forms, which are (in the eye of reason at least, and in their essential law) eternal and immutable, constitute *metaphysics*; and let the investigation of the Efficient Cause, and of Matter, and of the Latent Process, and the Latent Configuration (all of which have reference to the common and ordinary course of nature, not to her eternal and fundamental laws) constitute *physics*. And to these let there be subordinate two practical divisions: to physics, *mechanics*; to metaphysics, what (in a purer sense of the word) I call *magic*, on account of the broadness of the ways it moves in, and its greater command over nature.

### 3 Nonhumans as Machines

#### *René Descartes*

I specially dwelt on showing that if there were machines with the organs and appearance of a monkey, or some other irrational animal, we should have no means of telling that they were not altogether of the same nature as those animals; whereas if there were machines resembling our bodies, and imitating our actions as far as is morally possible, we should still have two means of telling that, all the same, they were not real men. First, they could never use words or other constructed signs, as we do to declare our thoughts to others. It is quite conceivable that a machine should be so made as to utter words, and even utter them in connexion with physical events that cause a change in one of its organs; so that e.g. if it is touched in one part, it asks what you want to say to it, and if touched in another, it cries out that it is hurt; but not that it should be so made as to arrange words variously in response to the meaning of what is said in its presence, as even the dullest men can do. Secondly, while they might do many things as well as any of us or better, they would infallibly fail in others, revealing that they acted not from knowledge but only from the disposition of their organs. For while reason is a universal tool that may serve in all kinds of circumstances, these organs need a special arrangement for each special action; so it is morally impossible that a machine should contain so many varied arrangements as to act in all the events of life in the way reason enables us to act.

Now in just these two ways we can also recognise the difference between men and brutes. For it is a very remarkable thing that there are no men so dull and stupid, not even lunatics, that they cannot arrange various words and form a sentence to make their thoughts (*pensées*) understood; but no other animal, however perfect or well bred, can do the like. This does not come from their lacking the organs; for

magpies and parrots can utter words like ourselves, and yet they cannot talk like us, that is, with any sign of being aware of (*qu'ils pensent*) what they say. Whereas men born deaf-mutes, and thus devoid of the organs that others use for speech, as much as brutes are or more so, usually invent for themselves signs by which they make themselves understood to those who are normally with them, and who thus have a chance to learn their language. This is evidence that brutes not only have a smaller degree of reason than men, but are wholly lacking in it. For it may be seen that a very small degree of reason is needed in order to be able to talk; and in view of the inequality that occurs among animals of the same species, as among men, and of the fact that some are easier to train than others, it is incredible that a monkey or parrot who was one of the most perfect members of his species should not be comparable in this regard to one of the stupidest children or at least to a child with a diseased brain, if their souls were not wholly different in nature from ours. And we must not confuse words with natural movements, the expressions of emotion, which can be imitated by machines as well as by animals. Nor must we think, like some of the ancients, that brutes talk but we cannot understand their language; for if that were true, since many of their organs are analogous to ours, they could make themselves understood to us, as well as to their fellows. It is another very remarkable thing that although several brutes exhibit more skill than we in some of their actions, they show none at all in many other circumstances; so their excelling us is no proof that they have a mind (*de l'esprit*), for in that case they would have a better one than any of us and would excel us all round; it rather shows that they have none, and that it is nature that acts in them according to the arrangements of their organs; just as

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we see how a clock, composed merely of wheels and springs, can reckon the hours and measure time more correctly than we can with all our wisdom.

I went on to describe the rational soul, and showed that, unlike the other things I had spoken of, it cannot be extracted from the potentiality of matter, but must be specially created; and how it is not enough for it to dwell in the human body like a pilot in his ship, which would only account for its moving the limbs of the body; in order to have in addition feelings and appetites like ours, and so make up a true man, it must be joined and united to the body more closely. Here I dwelt a little on the subject of the soul, as among the most important; for, after the error of denying God, (of which I think I have already given a sufficient refutation), there is none more likely to turn weak characters from the strait way of virtue than the supposition that the soul of brutes must be of the same nature as ours, so that after this life we have no more to hope or fear than flies or ants. Whereas, when we realise how much they really differ from us, we understand much better the arguments proving that our soul is of a nature entirely independent of the body, and thus not liable to die with it; and since we can discern no other causes that should destroy it, we are naturally led to decide that it is immortal.

[...]

I cannot share the opinion of Montaigne and others who attribute understanding or thought to animals. I am not worried that people say that human beings have absolute dominion over all the other animals; for I agree that some of them are stronger than us, and I believe that there may also be some animals which have a natural cunning capable of deceiving the shrewdest human beings. But I consider that they imitate or surpass us only in those of our actions which are not guided by our thought. It often happens that we walk or eat without thinking at all about what we are doing; and similarly, without using our reason, we reject things which are harmful for us, and parry the blows aimed at us. Indeed, even if we expressly willed not to put our hands in front of our head when we fall, we could not prevent ourselves. I consider also that if we had no thought then we would walk, as the animals do, without having learnt to; and it is said that those who walk in their sleep sometimes swim across streams in which they would drown if they were awake. As for the movements of our passions, even though in us they are

accompanied by thought because we have the faculty of thinking, it is nevertheless very clear that they do not depend on thought, because they often occur in spite of us. Consequently they can also occur in animals, even more violently than they do in human beings, without our being able to conclude from that that animals have thoughts.

In fact, none of our external actions can show anyone who examines them that our body is not just a self-moving machine but contains a soul with thoughts, with the exception of spoken words, or other signs that have reference to particular topics without expressing any passion. I say 'spoken words or other signs', because deaf-mutes use signs as we use spoken words; and I say that these signs must have reference, to exclude the speech of parrots, without excluding the speech of madmen, which has reference to particular topics even though it does not follow reason. I add also that these words or signs must not express any passion, to rule out not only cries of joy or sadness and the like, but also whatever can be taught by training to animals. If you teach a magpie to say good-day to its mistress when it sees her approach, this can only be by making the utterance of this word the expression of one of its passions. For instance it will be an expression of the hope of eating, if it has always been given a titbit when it says it. Similarly, all the things which dogs, horses and monkeys are taught to perform are only expressions of their fear, their hope or their joy; and consequently they can be performed without any thought. Now it seems to me very striking that the use of words, so defined, is something peculiar to human beings. Montaigne and Charron may have said that there is a greater difference between one human being and another than between a human being and an animal; yet there has never been known an animal so perfect as to use a sign to make other animals understand something which bore no relation to its passions; and there is no human being so imperfect as not to do so, since even deaf-mutes invent special signs to express their thoughts. This seems to me a very strong argument to prove that the reason why animals do not speak as we do is not that they lack the organs but that they have no thoughts. It cannot be said that they speak to each other but we cannot understand them; for since dogs and some other animals express their passions to us, they would express their thoughts also if they had any.

I know that animals do many things better than we do, but this does not surprise me. It can even be used

to prove that they act naturally and mechanically, like a clock which tells the time better than our judgement does. Doubtless when the swallows come in spring, they operate like clocks. The actions of honeybees are of the same nature; so also is the discipline of cranes in flight, and of apes in fighting, if it is true that they keep discipline. Their instinct to bury their dead is no stranger than that of dogs and cats which scratch the earth for the purpose of burying their excrement; they hardly ever actually bury it, which shows that they act only by instinct and without thinking. The most that one can say is that though the animals do not perform any action which shows us that they think, still, since the organs of their bodies are not very different from ours, it may be conjectured that there is attached to these organs some thought such as we experience in ourselves, but of a very much less perfect kind. To this I have nothing to reply except that if they thought as we do, they would have an immortal soul like us. This is unlikely, because there is no reason to believe it of some animals without believing it of all, and many of them such as oysters and sponges are too imperfect for this to be credible. But I am afraid of boring you with this discussion, and my only desire is to show you that I am, etc.

[...]

But there is no preconceived opinion to which we are all more accustomed from our earliest years than the belief that dumb animals think. Our only reason for this belief is the fact that we see that many of the organs of animals are not very different from ours in shape and movements. Since we believe that there is a single principle within us which causes these movements – namely the soul, which both moves the body and thinks – we do not doubt that some such soul is to be found in animals also. I came to realize, however, that there are two different principles causing our movements. The first is purely mechanical and corporeal, and depends solely on the force of the spirits and the structure of our organs, and can be called the corporeal soul. The other, an incorporeal principle, is the mind or that soul which I have defined as a thinking substance. Thereupon I investigated very carefully whether the movements of animals originated from both these principles or from one only. I soon perceived clearly that they could all originate from the corporeal and mechanical principle, and I regarded it as certain and demonstrated that we cannot at all prove the presence of a thinking soul in animals. I am not disturbed by the astuteness and cunning of dogs and foxes, or by all the things

which animals do for the sake of food, sex and fear; I claim that I can easily explain all of them as originating from the structure of their bodily parts.

But though I regard it as established that we cannot prove there is any thought in animals, I do not think it can be proved that there is none, since the human mind does not reach into their hearts. But when I investigate what is most probable in this matter, I see no argument for animals having thoughts except this one: since they have eyes, ears, tongues and other sense-organs like ours, it seems likely that they have sensation like us; and since thought is included in our mode of sensation, similar thought seems to be attributable to them. This argument, which is very obvious, has taken possession of the minds of all men from their earliest age. But there are other arguments, stronger and more numerous, but not so obvious to everyone, which strongly urge the opposite. One is that it is more probable that worms, flies, caterpillars and other animals move like machines than that they all have immortal souls.

In the first place, it is certain that in the bodies of animals, as in ours, there are bones, nerves, muscles, animal spirits and other organs so arranged that they can by themselves, without any thought, give rise to all the movements we observe in animals. This is very clear in convulsions, when the mechanism of the body moves despite the mind, and often moves more violently and in a more varied manner than usually happens when it is moved by the will.

Second, since art copies nature, and people can make various automatons which move without thought, it seems reasonable that nature should even produce its own automatons, which are much more splendid than artificial ones – namely the animals. This is especially likely since we know no reason why thought should always accompany the sort of arrangement of organs that we find in animals. It is much more wonderful that a mind should be found in every human body than that one should be lacking in every animal.

But in my opinion the main reason for holding that animals lack thought is the following. Within a single species some of them are more perfect than others, as humans are too. This can be seen in horses and dogs, some of which learn what they are taught much better than others; and all animals easily communicate to us, by voice or bodily movement, their natural impulses of anger, fear, hunger, and so on. Yet in spite of all these facts, it has never been

observed that any brute animal has attained the perfection of using real speech, that is to say, of indicating by word or sign something relating to thought alone and not to natural impulse. Such speech is the only certain sign of thought hidden in a body. All human beings use it, however stupid and insane they may be, even though they may have no tongue and organs of voice; but no animals do. Consequently this can be taken as a real specific difference between humans and animals.

For brevity's sake I here omit the other reasons for denying thought to animals. Please note that I am speaking of thought, and not of life or sensation. I do not deny life to animals, since I regard it as

consisting, simply in the heat of the heart; and I do not even deny sensation, in so far as it depends on a bodily organ. Thus my opinion is not so much cruel to animals as indulgent to human beings – at least to those who are not given to the superstitions of Pythagoras – since it absolves them from the suspicion of crime when they eat or kill animals.

Perhaps I have written at greater length than the sharpness of your intelligence requires; but I wished to show you that very few people have yet sent me objections which were as agreeable as yours. Your kindness and candour have made you a friend of that most respectful admirer of all who seek true wisdom.

## 4 Mechanistic Metaphysics

### *Isaac Newton*

Particles have not only a *Vis inertiae*, accompanied with such passive Laws of Motion as naturally result from that Force, but also that they are moved by certain active Principles, such as is that of Gravity, and that which causes Fermentation, and the Cohesion of Bodies. These Principles I consider, not as occult Qualities, supposed to result from the specifick Forms of Things, but as general Laws of Nature, by which the Things themselves are form'd; their Truth appearing to us by Phænomena, though their Causes be not yet discover'd. For these are manifest Qualities, and their Causes only are occult. And the *Aristotelians* gave the Name of occult Qualities, not to manifest Qualities, but to such Qualities only as they supposed to lie hid in Bodies, and to be the unknown Causes of manifest Effects: Such as would be the Causes of Gravity, and of magnetick and electrick Attractions, and of Fermentations, if we should suppose that these Forces or Actions arose from Qualities unknown to us, and incapable of being discovered and made manifest. Such occult Qualities put a stop to the Improvement of natural Philosophy, and therefore of late Years have been rejected. To tell us that every Species of Things is endow'd with an occult specifick

Quality by which it acts and produces manifest Effects, is to tell us nothing: But to derive two or three general Principles of Motion from Phænomena, and afterwards to tell us how the Properties and Actions of all corporeal Things follow from those manifest Principles, would be a very great step in Philosophy, though the Causes of those Principles were not yet discover'd: And therefore I scruple not to propose the Principles of Motion above-mention'd, they being of very general Extent, and leave their Causes to be found out.

Now by the help of these Principles, all material Things seem to have been composed of the hard and solid Particles above-mention'd, variously associated in the first Creation by the Counsel of an intelligent Agent. For it became him who created them to set them in order. And if he did so, it's unphilosophical to seek for any other Origin of the World, or to pretend that it might arise out of a Chaos by the mere Laws of Nature; though being once form'd, it may continue by those Laws for many Ages. For while Comets move in very excentrick Orbs in all manner of Positions, blind Fate could never make all the Planets move one and the same way in Orbs concentrick, some inconsiderable Irregularities excepted, which may have risen from

the mutual Actions of Comets and Planets upon one another, and which will be apt to increase, till this System wants a Reformation. Such a wonderful Uniformity in the Planetary System must be allowed the Effect of Choice. And so must the Uniformity in the Bodies of Animals, they having generally a right and a left side shaped alike, and on either side of their Bodies two Legs behind, and either two Arms, or two Legs, or two Wings before upon their Shoulders, and between their Shoulders a Neck running down into a Back-bone, and a Head upon it; and in the Head two Ears, two Eyes, a Nose, a Mouth, and a Tongue, alike situated. Also the first Contrivance of those very artificial Parts of Animals, the Eyes, Ears, Brain, Muscles, Heart, Lungs, Midriff, Glands, Larynx, Hands, Wings, swimming Bladders, natural Spectacles, and other Organs of Sense and Motion; and the Instinct of Brutes and Insects, can be the effect of nothing else than the Wisdom and Skill of a powerful ever-living Agent, who being in all Places, is more able by his Will to move the Bodies within his boundless uniform Sensorium, and thereby to form and reform the Parts of the Universe, than we are by our Will to

move the Parts of our own Bodies. And yet we are not to consider the World as the Body of God, or the several Parts thereof, as the Parts of God. He is an uniform Being, void of Organs, Members or Parts, and they are his Creatures subordinate to him, and subservient to his Will; and he is no more the Soul of them, than the Soul of Man is the Soul of the Species of Things carried through the Organs of Sense into the place of its Sensation, where it perceives them by means of its immediate Presence, without the Intervention of any third thing. The Organs of Sense are not for enabling the Soul to perceive the Species of Things in its Sensorium, but only for conveying them thither; and God has no need of such Organs, he being every where present to the Things themselves. And since Space is divisible *in infinitum*, and Matter is not necessarily in all places, it may be also allow'd that God is able to create Particles of Matter of several Sizes and Figures, and in several Proportions to Space, and perhaps of different Densities and Forces, and thereby to vary the Laws of Nature, and make Worlds of several sorts in several Parts of the Universe. At least, I see nothing of Contradiction in all this.

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## 5 The Amoral Status of Nature

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### *John Stuart Mill*

Nature, natural, and the group of words derived from them, or allied to them in etymology, have at all times filled a great place in the thoughts and taken a strong hold on the feelings of mankind. That they should have done so is not surprising, when we consider what the words, in their primitive and most obvious signification, represent; but it is unfortunate that a set of terms which play so great a part in moral and metaphysical speculation, should have acquired many meanings different from the primary one, yet sufficiently allied to it to admit of confusion. The words have thus become entangled in so many foreign associations, mostly of a very powerful and tenacious character, that they have come to excite,

and to be the symbols of, feelings which their original meaning will by no means justify; and which have made them one of the most copious sources of false taste, false philosophy, false morality, and even bad law.

[...]

As the nature of any given thing is the aggregate of its powers and properties, so Nature in the abstract is the aggregate of the powers and properties of all things. Nature means the sum of all phenomena, together with the causes which produce them; including not only all that happens, but all that is capable of happening; the unused capabilities of causes being as much a part of the idea of Nature, as those which

take effect. Since all phenomena which have been sufficiently examined are found to take place with regularity, each having certain fixed conditions, positive and negative, on the occurrence of which it invariably happens; mankind have been able to ascertain, either by direct observation or by reasoning processes grounded on it, the conditions of the occurrence of many phenomena; and the progress of science mainly consists in ascertaining those conditions. When discovered they can be expressed in general propositions, which are called laws of the particular phenomenon, and also, more generally, Laws of Nature. Thus, the truth that all material objects tend towards one another with a force directly as their masses and inversely as the square of their distance, is a law of Nature. The proposition that air and food are necessary to animal life, if it be as we have good reason to believe, true without exception, is also a law of nature, though the phenomenon of which it is the law is special, and not, like gravitation, universal.

Nature, then, in this its simplest acceptation, is a collective name for all facts, actual and possible: or (to speak more accurately) a name for the mode, partly known to us and partly unknown, in which all things take place. For the word suggests, not so much the multitudinous detail of the phenomena, as the conception which might be formed of their manner of existence as a mental whole, by a mind possessing a complete knowledge of them: to which conception it is the aim of science to raise itself, by successive steps of generalization from experience.

Such, then, is a correct definition of the word Nature. But this definition corresponds only to one of the senses of that ambiguous term. It is evidently inapplicable to some of the modes in which the word is familiarly employed. For example, it entirely conflicts with the common form of speech by which Nature is opposed to Art, and natural to artificial. For in the sense of the word Nature which has just been defined, and which is the true scientific sense, Art is as much Nature as anything else; and everything which is artificial is natural – Art has no independent powers of its own: Art is but the employment of the powers of Nature for an end. Phenomena produced by human agency, no less than those which as far as we are concerned are spontaneous, depend on the properties of the elementary forces, or of the elementary substances and their compounds. The united powers of the whole human race could not create a new property of matter in general, or of any

one, of its species. We can only take advantage for our purposes of the properties which we find. A ship floats by the same laws of specific gravity and equilibrium, as a tree uprooted by the wind and blown into the water. The corn which men raise for food, grows and produces its grain by the same laws of vegetation by which the wild rose and the mountain strawberry bring forth their flowers and fruit. A house stands and holds together by the natural properties, the weight and cohesion of the materials which compose it: a steam engine works by the natural expansive force of steam, exerting a pressure upon one part of a system of arrangements, which pressure, by the mechanical properties of the lever, is transferred from that to another part where it raises the weight or removes the obstacle brought into connexion with it. In these and all other artificial operations the office of man is, as has often been remarked, a very limited one; it consists in moving things into certain places. We move objects, and by doing this, bring some things into contact which were separate, or separate others which were in contact: and by this simple change of place, natural forces previously dormant are called into action, and produce the desired effect. Even the volition which designs, the intelligence which contrives, and the muscular force which executes these movements, are themselves powers of Nature.

It thus appears that we must recognize at least two principal meanings in the word Nature. In one sense, it means all the powers existing in either the outer or the inner world and everything which takes place by means of those powers. In another sense, it means, not everything which happens, but only what takes place without the agency, or without the voluntary and intentional agency, of man. This distinction is far from exhausting the ambiguities of the word; but it is the key to most of those on which important consequences depend.

[...]

Is it necessary to recognize in these forms of speech, another distinct meaning of the word Nature? Or can they be connected, by any rational bond of union, with either of the two meanings already treated of? At first it may seem that we have no option but to admit another ambiguity in the term. All inquiries are either into what is, or into what ought to be: science and history belonging to the first division, art, morals and politics to the second. But the two senses of the word Nature first pointed out, agree in referring only to what is. In the first meaning, Nature is a collective

name for everything which is. In the second, it is a name for everything which is of itself, without voluntary human intervention. But the employment of the word Nature as a term of ethics seems to disclose a third meaning, in which Nature does not stand for what is, but for what ought to be; or for the rule or standard of what ought to be. A little consideration, however, will show that this is not a case of ambiguity; there is not here a third sense of the word. Those who set up Nature as a standard of action do not intend a merely verbal proposition; they do not mean that the standard, whatever it be, should be *called* Nature; they think they are giving some information as to what the standard of action really is. Those who say that we ought to act according to Nature do not mean the mere identical proposition that we ought to do what we ought to do. They think that the word Nature affords some external criterion of what we should do; and if they lay down as a rule for what ought to be, a word which in its proper signification denotes what is, they do so because they have a notion, either clearly or confusedly, that what is, constitutes the rule and standard of what ought to be.

[...]

The conception which the ethical use of the word Nature implies, of a close relation if not absolute identity between what is and what ought to be, certainly derives part of its hold on the mind from the custom of designating what is, by the expression "laws of nature," while the same word Law is also used, and even more familiarly and emphatically, to express what ought to be.

When it is asserted, or implied, that Nature, or the laws of Nature, should be conformed to, is the Nature which is meant, Nature in the first sense of the term, meaning all which is – the powers and properties of all things? But in this signification, there is no need of a recommendation to act according to nature, since it is what nobody can possibly help doing, and equally whether he acts well or ill. There is no mode of acting which is not conformable to Nature in this sense of the term, and all modes of acting are so in exactly the same degree. Every action is the exertion of some natural power, and its effects of all sorts are so many phenomena of nature, produced by the powers and properties of some of the objects of nature, in exact obedience to some law or laws of nature. When I voluntarily use my organs to take in food, the act, and its consequences, take place according to laws of nature: if instead of food I swallow poison, the case is exactly the same.

To bid people conform to the laws of nature when they have no power but what the laws of nature give them – when it is a physical impossibility for them to do the smallest thing otherwise than through some law of nature, is an absurdity. The thing they need to be told is, what particular law of nature they should make use of in a particular case. When, for example, a person is crossing a river by a narrow bridge to which there is no parapet, he will do well to regulate his proceedings by the laws of equilibrium in moving bodies, instead of conforming only to the law of gravitation, and falling into the river.

Yet, idle as it is to exhort people to do what they cannot avoid doing, and absurd as it is to prescribe as a rule of right conduct what agrees exactly as well with wrong; nevertheless a rational rule of conduct *may* be constructed out of the relation which it ought to bear to the laws of nature in this widest acceptation of the term. Man necessarily obeys the laws of nature, or in other words the properties of things, but he does not necessarily *guide* himself by them. Though all conduct is in conformity to laws of nature, all conduct is not grounded on knowledge of them, and intelligently directed to the attainment of purposes by means of them. Though we cannot emancipate ourselves from the laws of nature as a whole, we can escape from any particular law of nature, if we are able to withdraw ourselves from the circumstances in which it acts. Though we can do nothing except through laws of nature, we can use one law to counteract another.

According to Bacon's maxim, we can obey nature in such a manner as to command it. Every alteration of circumstances alters more or less the laws of nature under which we act; and by every choice which we make either of ends or of means, we place ourselves to a greater or less extent under one set of laws of nature instead of another. If, therefore, the useless precept to follow nature were changed into a precept to study nature; to know and take heed of the properties of the things we have to deal with, so far as these properties are capable of forwarding or obstructing any given purpose; we should have arrived at the first principle of all intelligent action, or rather at the definition of intelligent action itself. And a confused notion of this true principle, is, I doubt not, in the minds of many of those who set up the unmeaning doctrine which superficially resembles it. They perceive that the essential difference between wise and foolish conduct consists in attending, or not attending, to the particular laws of nature

on which some important result depends. And they think, that a person who attends to a law of nature in order to shape his conduct by it, may be said to obey it, while a person who practically disregards it, and acts as if no such law existed, may be said to disobey it: the circumstance being overlooked, that what is thus called disobedience to a law of nature is obedience to some other or perhaps to the very law itself. For example, a person who goes into a powder magazine either not knowing, or carelessly omitting to think of, the explosive force of gunpowder, is likely to do some act which will cause him to be blown to atoms in obedience to the very law which he has disregarded.

[...]

Right action, must mean something more and other than merely intelligent action: yet no precept beyond this last, can be connected with the word Nature in the wider and more philosophical of its acceptations. We must try it therefore in the other sense, that in which Nature stands distinguished from Art, and denotes, not the whole course of the phenomena which come under our observation, but only their spontaneous course.

Let us then consider whether we can attach any meaning to the supposed practical maxim of following Nature, in this second sense of the word, in which Nature stands for that which takes place without human intervention. In Nature as thus understood, is the spontaneous course of things when left to themselves, the rule to be followed in endeavouring to adapt things to our use? But it is evident at once that the maxim, taken in this sense, is not merely, as it is in the other sense, superfluous and unmeaning, but palpably absurd and self-contradictory. For while human action cannot help conforming to Nature in the one meaning of the term, the very aim and object of action is to alter and improve Nature in the other meaning. If the natural course of things were perfectly right and satisfactory, to act at all would be a gratuitous meddling, which as it could not make things better, must make them worse. Or if action at all could be justified, it would only be when in direct obedience to instincts, since these might perhaps be accounted part of the spontaneous order of Nature; but to do anything with forethought and purpose, would be a violation of that perfect order. If the artificial is not better than the natural, to what end are all the arts of life? To dig, to plough, to build, to wear clothes, are direct infringements of the injunction to follow nature.

Accordingly it would be said by every one, even of those most under the influence of the feelings which prompt the injunction, that to apply it to such cases as those just spoken of, would be to push it too far. Everybody professes to approve and admire many great triumphs of Art over Nature: the junction by bridges of shores which Nature had made separate, the draining of Nature's marshes, the excavation of her wells, the dragging to light of what she has buried at immense depths in the earth; the turning away of her thunderbolts by lightning rods, of her inundations by embankments, of her ocean by breakwaters. But to commend these and similar feats, is to acknowledge that the ways of Nature are to be conquered, not obeyed: that her powers are often towards man in the position of enemies, from whom he must wrest, by force and ingenuity, what little he can for his own use, and deserves to be applauded when that little is rather more than might be expected from his physical weakness in comparison to those gigantic powers. All praise of Civilization, or Art, or Contrivance, is so much dispraise of Nature; an admission of imperfection, which it is man's business, and merit, to be always endeavouring to correct or mitigate.

The consciousness that whatever man does to improve his condition is in so much a censure and a thwarting of the spontaneous order of Nature, has in all ages caused new and unprecedented attempts at improvement to be generally at first under a shade of religious suspicion; as being in any case uncomplimentary, and very probably offensive to the powerful beings (or, when polytheism gave place to monotheism, to the all-powerful Being) supposed to govern the various phenomena of the universe, and of whose will the course of nature was conceived to be the expression. Any attempt to mould natural phenomena to the convenience of mankind might easily appear an interference with the government of those superior beings: and though life could not have been maintained, much less made pleasant, without perpetual interferences of the kind, each new one was doubtless made with fear and trembling, until experience had shown that it could be ventured on without drawing down the vengeance of the Gods. The sagacity of priests showed them a way to reconcile the impunity of particular infringements with the maintenance of the general dread of encroaching on the divine administration. This was effected by representing each of the principal human inventions as the gift and favour of some God. The old religions also afforded many resources for consulting the Gods,

and obtaining their express permission for what would otherwise have appeared a breach of their prerogative. When oracles had ceased, any religion which recognized a revelation afforded expedients for the same purpose. The Catholic religion had the resource of an infallible Church, authorized to declare what exertions of human spontaneity were permitted or forbidden; and in default of this, the case was always open to argument from the Bible whether any particular practice had expressly or by implication been sanctioned. The notion remained that this liberty to control Nature was conceded to man only by special indulgence, and as far as required by his necessities; and there was always a tendency, though a diminishing one, to regard any attempt to exercise power over nature, beyond a certain degree, and a certain admitted range, as an impious effort to usurp divine power, and dare more than was permitted to man. The lines of Horace in which the familiar

arts of shipbuilding and navigation are reprobated as *vetitum nefas*, indicate even in that sceptical age a still unexhausted vein of the old sentiment. The intensity of the corresponding feeling in the middle ages is not a precise parallel, on account of the superstition about dealing with evil spirits with which it was complicated: but the imputation of prying into the secrets of the Almighty long remained a powerful weapon of attack against unpopular inquirers into nature; and the charge of presumptuously attempting to defeat the designs of Providence, still retains enough of its original force to be thrown in as a make-weight along with other objections when there is a desire to find fault with any new exertion of human forethought and contrivance. No one, indeed, asserts it to be the intention of the Creator that the spontaneous order of the creation should not be altered, or even that it should not be altered in any new way.

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## 6 Nature as Economic Resource

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### *John Locke*

25. Whether we consider natural reason, which tells us that men, being once born, have a right to their preservation, and consequently to meat and drink and such other things as Nature affords for their subsistence, or “revelation,” which gives us an account of those grants God made of the world to Adam, and to Noah and his sons, it is very clear that God, as King David says (Psalm cxv. 16), “has given the earth to the children of men,” given it to mankind in common. But, this being supposed, it seems to some a very great difficulty how any one should ever come to have a property in anything, I will not content myself to answer, that, if it be difficult to make out “property” upon a supposition that God gave the world to Adam and his posterity in common, it is impossible that any man but one universal monarch should have any “property” upon a supposition that God gave the world to Adam and his

heirs in succession, exclusive of all the rest of his posterity; but I shall endeavour to show how men might come to have a property in several parts of that which God gave to mankind in common, and that without any express compact of all the commoners.

26. God, who hath given the world to men in common, hath also given them reason to make use of it to the best advantage of life and convenience. The earth and all that is therein is given to men for the support and comfort of their being. And though all the fruits it naturally produces, and beasts it feeds, belong to mankind in common, as they are produced by the spontaneous hand of Nature, and nobody has originally a private dominion exclusive of the rest of mankind in any of them, as they are thus in their natural state, yet being given for the use of men, there must of necessity be a means to appropriate them some way or other before they can be of any

use, or at all beneficial, to any particular men. The fruit or venison which nourishes the wild Indian, who knows no enclosure, and is still a tenant in common, must be his, and so his – *i.e.*, a part of him, that another can no longer have any right to it before it can do him any good for the support of his life.

27. Though the earth and all inferior creatures be common to all men, yet every man has a “property” in his own “person.” This nobody has any right to but himself. The “labour” of his body and the “work” of his hands, we may say, are properly his. Whatsoever, then, he removes out of the state that Nature hath provided and left it in, he hath mixed his labour with it, and joined to it something that is his own, and thereby makes it his property. It being by him removed from the common state Nature placed it in, it hath by this labour something annexed to it that excludes the common right of other men. For this “labour” being the unquestionable property of the labourer, no man but he can have a right to what that is once joined to, at least where there is enough, and as good left in common for others.

28. He that is nourished by the acorns he picked up under an oak, or the apples he gathered from the trees in the wood, has certainly appropriated them to himself. Nobody can deny but the nourishment is his. I ask, then, when did they begin to be his? when he digested? or when he ate? or when he boiled? or when he brought them home? or when he picked them up? And it is plain, if the first gathering made them not his, nothing else could. That labour put a distinction between them and common. That added something to them more than Nature, the common mother of all, had done, and so they became his private right. And will any one say he had no right to those acorns or apples he thus appropriated because he had not the consent of all mankind to make them his? Was it a robbery thus to assume to himself what belonged to all in common? If such a consent as that was necessary, man had starved, notwithstanding the plenty God had given him. We see in commons, which remain so by compact, that it is the taking any part of what is common, and removing it out of the state Nature leaves it in, which begins the property, without which the common is of no use. And the taking of this or that part does not depend on the express consent of all the commoners. Thus, the grass my horse has bit, the turfs my servant has cut, and the ore I have digged in any place, where I have a right to them in common with others, become my property without the assignation or consent of any-

body. The labour that was mine, removing them out of that common state they were in, hath fixed my property in them.

29. By making an explicit consent of every commoner necessary to any one’s appropriating to himself any part of what is given in common. Children or servants could not cut the meat which their father or master had provided for them in common without assigning to every one his peculiar part. Though the water running in the fountain be every one’s, yet who can doubt but that in the pitcher is his only who drew it out? His labour hath taken it out of the hands of Nature where it was common, and belonged equally to all her children, and hath thereby appropriated it to himself.

30. Thus this law of reason makes the deer that Indian’s who hath killed it; it is allowed to be his goods who hath bestowed his labour upon it, though, before, it was the common right of every one. And amongst those who are counted the civilised part of mankind, who have made and multiplied positive laws to determine property, this original law of Nature for the beginning of property, in what was before common, still takes place, and by virtue thereof, what fish any one catches in the ocean, that great and still remaining common of mankind; or what ambergris any one takes up here is by the labour that removes it out of that common state Nature left it in, made his property who takes that pains about it. And even amongst us, the hare that any one is hunting is thought his who pursues her during the chase. For being a beast that is still looked upon as common, and no man’s private possession, whoever has employed so much labour about any of that kind as to find and pursue her has thereby removed her from the state of Nature wherein she was common, and hath begun a property.

31. It will, perhaps, be objected to this, that if gathering the acorns or other fruits of the earth, etc., makes a right to them, then any one may engross as much as he will. To which I answer, Not so. The same law of Nature that does by this means give us property, does also bound that property too. “God has given us all things richly.” Is the voice of reason confirmed by inspiration? But how far has He given it us – “to enjoy”? As much as any one can make use of to any advantage of life before it spoils, so much he may by his labour fix a property in. Whatever is beyond this is more than his share, and belongs to others. Nothing was made by God for man to spoil or destroy. And thus considering the plenty of

natural provisions there was a long time in the world, and the few spenders, and to how small a part of that provision the industry of one man could extend itself and engross it to the prejudice of others, especially keeping within the bounds set by reason of what might serve for his use, there could be then little room for quarrels or contentions about property so established.

32. But the chief matter of property being now not the fruits of the earth and the beasts that subsist on it, but the earth itself, as that which takes in and carries with it all the rest, I think it is plain that property in that too is acquired as the former. As much land as a man tills, plants, improves, cultivates, and can use the product of, so much is his property. He by his labour does, as it were, enclose it from the common. Nor will it invalidate his right to say everybody else has an equal title to it, and therefore he cannot appropriate, he cannot enclose, without the consent of all his fellow-commoners, all mankind. God, when He gave the world in common to all mankind, commanded man also to labour, and the penury of his condition required it of him. God and his reason commanded him to subdue the earth – *i.e.*, improve it for the benefit of life and therein lay out something upon it that was his own, his labour. He that, in obedience to this command of God, subdued, tilled, and sowed any part of it, thereby annexed to it something that was his property, which another had no title to, nor could without injury take from him.

33. Nor was this appropriation of any parcel of land, by improving it, any prejudice to any other man, since there was still enough and as good left, and more than the yet unprovided could use. So that, in effect, there was never the less left for others because of his enclosure for himself. For he that leaves as much as another can make use of does as good as take nothing at all. Nobody could think himself injured by the drinking of another man, though he took a good draught, who had a whole river of the same water left him to quench his thirst. And the case of land and water, where there is enough of both, is perfectly the same.

34. God gave the world to men in common, but since He gave it them for their benefit and the greatest conveniencies of life they were capable to draw from it, it cannot be supposed He meant it should always remain common and uncultivated. He gave it to the use of the industrious and rational (and labour was to be his title to it); not to the fancy or covetous-

ness of the quarrelsome and contentious. He that had as good left for his improvement as was already taken up needed not complain, ought not to meddle with what was already improved by another's labour; if he did it is plain he desired the benefit of another's pains, which he had no right to, and not the ground which God had given him, in common with others, to labour on, and whereof there was as good left as that already possessed, and more than he knew what to do with, or his industry could reach to.

35. It is true, in land that is common in England or any other country, where there are plenty of people under government who have money and commerce, no one can enclose or appropriate any part without the consent of all his fellow-commoners; because this is left common by compact – *i.e.*, by the law of the land, which is not to be violated. And, though it be common in respect of some men, it is not so to all mankind, but is the joint propriety of this country, or this parish. Besides, the remainder, after such enclosure, would not be as good to the rest of the commoners as the whole was, when they could all make use of the whole; whereas in the beginning and first peopling of the great common of the world it was quite otherwise. The law man was under was rather for appropriating. God commanded, and his wants forced him to labour. That was his property, which could not be taken from him wherever he had fixed it. And hence subduing or cultivating the earth and having dominion, we see, are joined together. The one gave title to the other. So that God, by commanding to subdue, gave authority so far to appropriate. And the condition of human life, which requires labour and materials to work on, necessarily introduces private possessions.

36. The measure of property Nature well set, by the extent of men's labour and the conveniency of life. No man's labour could subdue or appropriate all, nor could his enjoyment consume more than a small part; so that it was impossible for any man, this way, to entrench upon the right of another or acquire to himself a property to the prejudice of his neighbour, who would still have room for as good and as large a possession (after the other had taken out his) as before it was appropriated. Which measure did confine every man's possession to a very moderate proportion, and such as he might appropriate to himself without injury to anybody in the first ages of the world, when men were more in danger to be lost, by wandering from their company, in the then vast wilderness of the earth than to be straitened for

want of room to plant in. And the same measure may be allowed still, without prejudice to anybody, full as the world seems. For, supposing a man or family, in the state they were at first, peopling of the world by the children of Adam or Noah, let him plant in some inland vacant places of America. We shall find that the possessions he could make himself, upon the measures we have given, would not be very large, nor, even to this day, prejudice the rest of mankind or give them reason to complain or think themselves injured by this man's encroachment, though the race of men have now spread themselves to all the corners of the world, and do infinitely exceed the small number was at the beginning. Nay, the extent of ground is of so little value without labour that I have heard it affirmed that in Spain itself a man may be permitted to plough, sow, and reap, without being disturbed, upon land he has no other title to, but only his making use of it. But, on the contrary, the inhabitants think themselves beholden to him who, by his industry on neglected, and consequently waste land, has increased the stock of corn, which they wanted. But be this as it will, which I lay no stress on, this I dare boldly affirm, that the same rule of propriety – viz., that every man should have as much as he could make use of, would hold still in the world, without straitening anybody, since there is land enough in the world to suffice double the inhabitants, had not the invention of money, and the tacit agreement of men to put a value on it, introduced (by consent) larger possession and a right to them; which, how it has done, I shall by and by show more at large.

37. This is certain, that in the beginning, before the desire of having more than men needed had altered the intrinsic value of things, which depends only on their usefulness to the life of man, or had agreed that a little piece of yellow metal, which would keep without wasting or decay, should be worth a great piece of flesh or a whole heap of corn, though men had a right to appropriate by their labour, each one to himself, as much of the things of Nature as he could use, yet this could not be much, nor to the prejudice of others, where the same plenty was still left, to those who would use the same industry.

Before the appropriation of land, he who gathered as much of the wild fruit, killed, caught, or tamed as many of the beasts as he could – he that so employed his pains about any of the spontaneous products of Nature as any way to alter them from the state Nature put them in, by placing any of his labour on them,

did thereby acquire a propriety in them; but if they perished in his possession without their due use – if the fruits rotted or the venison putrefied before he could spend it, he offended against the common law of Nature, and was liable to be punished: he invaded his neighbour's share, for he had no right farther than his use called for any of them, and they might serve to afford him conveniencies of life.

38. The same measures governed the possession of land, too. Whatsoever he tilled and reaped, laid up and made use of before it spoiled, that was his peculiar right; whatsoever he enclosed, and could feed and make use of, the cattle and product was also his. But if either the grass of his enclosure rotted on the ground, or the fruit of his planting perished without gathering and laying up, this part of the earth, notwithstanding his enclosure, was still to be looked on as waste, and might be the possession of any other. Thus, at the beginning, Cain might take as much ground as he could till and make it his own land, and yet leave enough to Abel's sheep to feed on: a few acres would serve for both their possessions. But as families increased and industry enlarged their stocks, their possessions enlarged with the need of them; but yet it was commonly without any fixed property in the ground they made use of till they incorporated, settled themselves together, and built cities, and then, by consent, they came in time to set out the bounds of their distinct territories and agree on limits between them and their neighbours, and by laws within themselves settled the properties of those of the same society. For we see that in that part of the world which was first inhabited, and therefore like to be best peopled, even as low down as Abraham's time, they wandered with their flocks and their herds, which was their substance, freely up and down – and this Abraham did in a country where he was a stranger; whence it is plain that, at least, a great part of the land lay in common, that the inhabitants valued it not, nor claimed property in any more than they made use of; but when there was not room enough in the same place for their herds to feed together, they, by consent, as Abraham and Lot did (Gen. xiii. 5), separated and enlarged their pasture where it best liked them. And for the same reason, Esau went from his father and his brother, and planted in Mount Seir (Gen. xxxvi. 6).

[...]

43. An acre of land that bears here twenty bushels of wheat, and another in America, which, with the same husbandry, would do the like, are, without

doubt, of the same natural, intrinsic value. But, yet the benefit mankind receives from one in a year is worth five pounds, and the other possibly not worth a penny; if all the profit an Indian received from it were to be valued and sold here, at least I may truly say, not one thousandth. It is labour, then, which puts the greatest part of value upon land, without which it would scarcely be worth anything; it is to that we owe the greatest part of all its useful products; for all that the straw, bran, bread, of that acre of wheat, is more worth than the product of an acre of as good land which lies waste is all the effect of labour. For it is not barely the ploughman's pains, the reaper's and thresher's toil, and the baker's sweat, is to be counted into the bread we eat; the labour of those who broke the oxen, who digged and wrought the iron and stones, who felled and framed the timber employed about the plough, mill, oven, or any other utensils, which are a vast number, requisite to this corn, from its sowing to its being made bread, must all be charged on the account of labour, and received as an effect of that; Nature and the earth furnished only the almost worthless materials as in themselves. It would be a strange catalogue of things that industry provided and made use of about every loaf of bread before it came to our use if we could trace them; iron, wood, leather, bark, timber, stone, bricks, coals, lime, cloth, dyeing-drugs, pitch, tar, masts, ropes, and all the materials made use of in the ship that brought any of the commodities made use of by any of the workmen, to any part of the work, all which it would be almost impossible, at least too long, to reckon up.

44. From all which it is evident, that though the things of Nature are given in common, man (by being master of himself, and proprietor of his own person, and the actions or labour of it) had still in himself the great foundation of property; and that which made up the great part of what he applied to the support or comfort of his being, when invention and arts had improved the conveniences of life, was perfectly his own, and did not belong in common to others.

45. Thus labour, in the beginning, gave a right of property, wherever any one was pleased to employ

it, upon what was common, which remained a long while, the far greater part, and is yet more than mankind makes use of. Men at first, for the most part, contented themselves with what unassisted Nature offered to their necessities; and though afterwards, in some parts of the world, where the increase of people and stock, with the use of money, had made land scarce, and so of some value, the several communities settled the bounds of their distinct territories, and, by laws, within themselves, regulated the properties of the private men of their society, and so, by compact and agreement, settled the property which labour and industry began. And the leagues that have been made between several states and kingdoms, either expressly or tacitly disowning all claim and right to the land in the other's possession, have, by common consent, given up their pretences to their natural common right, which originally they had to those countries; and so have, by positive agreement, settled a property amongst themselves, in distinct parts of the world; yet there are still great tracts of ground to be found, which the inhabitants thereof, not having joined with the rest of mankind in the consent of the use of their common money, lie waste, and are more than the people who dwell on it, do, or can make use of, and so still lie in common; though this can scarce happen amongst that part of mankind that have consented to the use of money.

[...]

51. And thus, I think, it is very easy to conceive, without any difficulty, how labour could at first begin a title of property in the common things of Nature, and how the spending it upon our uses bounded it; so that there could then be no reason of quarrelling about title, nor any doubt about the largeness of possession it gave. Right and convenience went together. For as a man had a right to all he could employ his labour upon, so he had no temptation to labour for more than he could make use of. This left no room for controversy about the title, nor for encroachment on the right of others. What portion a man carved to himself was easily seen; and it was useless, as well as dishonest, to carve himself too much, or take more than he needed.

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## 7 Indirect Duties to Nonhumans

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### *Immanuel Kant*

#### Duties Towards Animals and Spirits

So far as animals are concerned, we have no direct duties. Animals are not self-conscious and are there merely as a means to an end. That end is man. We can ask, 'Why do animals exist?' But to ask, 'Why does man exist?' is a meaningless question. Our duties towards animals are merely indirect duties towards humanity. Animal nature has analogies to human nature, and by doing our duties to animals in respect of manifestations which correspond to manifestations of human nature, we indirectly do our duty towards humanity. Thus, if a dog has served his master long and faithfully, his service, on the analogy of human service, deserves reward, and when the dog has grown too old to serve, his master ought to keep him until he dies. Such action helps to support us in our duties towards human beings, where they are bounden duties. If then any acts of animals are analogous to human acts and spring from the same principles, we have duties towards the animals because thus we cultivate the corresponding duties towards human beings. If a man shoots his dog because the animal is no longer capable of service, he does not fail in his duty to the dog, for the dog cannot judge, but his act is inhuman and damages in himself that humanity which it is his duty to show towards mankind. If he is not to stifle his human feelings, he must practise kindness towards animals, for he who is cruel to animals becomes hard also in his dealings with men. We can judge the heart of a man by his treatment of animals. Hogarth<sup>1</sup> depicts this in his engravings. He shows how cruelty grows and develops. He shows the child's cruelty to animals, pinching the tail of a dog or a cat; he then depicts the grown man in his cart running over a child; and lastly, the culmination of cruelty in murder. He thus brings home to us in a terrible fashion the rewards of cruelty, and this should be an impressive lesson to children. The more we come in

contact with animals and observe their behaviour, the more we love them, for we see how great is their care for their young. It is then difficult for us to be cruel in thought even to a wolf. Leibnitz used a tiny worm for purposes of observation, and then carefully replaced it with its leaf on the tree so that it should not come to harm through any act of his. He would have been sorry – a natural feeling for a humane man – to destroy such a creature for no reason. Tender feelings towards dumb animals develop humane feelings towards mankind. In England butchers and doctors do not sit on a jury because they are accustomed to the sight of death and hardened. Vivisectionists, who use living animals for their experiments, certainly act cruelly, although their aim is praiseworthy, and they can justify their cruelty, since animals must be regarded as man's instruments; but any such cruelty for sport cannot be justified. A master who turns out his ass or his dog because the animal can no longer earn its keep manifests a small mind. The Greeks' ideas in this respect were high-minded, as can be seen from the fable of the ass and the bell of ingratitude.<sup>2</sup> Our duties towards animals, then, are indirect duties towards mankind.

Our duties towards immaterial beings are purely negative. Any course of conduct which involves dealings with spirits is wrong. Conduct of this kind makes men visionaries and fanatics, renders them superstitious, and is not in keeping with the dignity of mankind; for human dignity cannot subsist without a healthy use of reason, which is impossible for those who have commerce with spirits. Spirits may exist or they may not; all that is said of them may be true; but we know them not and can have no intercourse with them. This applies to good and to evil spirits alike. Our Ideas of good and evil are coordinate, and as we refer all evil to hell so we refer all good to heaven. If we personify the perfection of evil, we have the Idea of the devil. If we believe that evil spirits can have an influence upon us, can appear

and haunt us at night, we become a prey to phantoms and incapable of using our powers in a reasonable way. Our duties towards such beings must, therefore, be negative.

### Duties Towards Inanimate Objects

[Consider also] duties towards inanimate objects. These duties are also indirectly duties towards mankind. Destructiveness is immoral; we ought not to destroy things which can still be put to some use. No man ought to mar the beauty of nature; for what he has no use for may still be of use to some

one else. He need, of course, pay no heed to the thing itself, but he ought to consider his neighbour. Thus we see that all duties towards animals, towards immaterial beings and towards inanimate objects are aimed indirectly at our duties towards mankind.

### Notes

- 1 Hogarth's four engravings, 'The Stages of Cruelty', 1751.
- 2 Philipp Camerarius, *Operae horarum subcisivarum centuria prima*, 1644, cap. XXI.

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## 8 In Defense of Anthropocentrism

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### The Concept of 'Intrinsic Values'

The attempt to attribute 'intrinsic' value to the environment has probably been one of the central and the most recalcitrant problems of environmental ethics.<sup>1</sup> But one prominent contributor to the debate believes that it would be better to abandon the attempt altogether (Regan 1992). He may well be right, since the term 'intrinsic' value means different things to different people. So we shall simply state here how we shall interpret it before going on to consider its applicability to the environment in general or nature in particular. We use the term 'intrinsic' value [...] to indicate merely one part of a twofold classification of values as being either 'intrinsic' or 'instrumental'.<sup>2</sup> By that we mean that objects of value are, respectively, either valued for their own sake or valued for the sake of the contribution that they make to some other objective.

Some objects may have both kinds of value. For example, beautiful music may be valued for its own sake and may also possess the instrumental therapeutic value of soothing the savage breast. Flowers may

have intrinsic aesthetic value and also have the instrumental value of providing important sources of food for insects or medicinal beverages for herbalists. Similarly, a primeval forest would be *instrumentally* valuable insofar as it contains scientifically valuable information that can be potentially useful for, say, medicinal purposes. But some people would claim that it is also valuable in itself over and above its usefulness: that it is *intrinsically* valuable.

There are two main routes by which one can arrive at the conclusion that certain values are intrinsic. One is the 'objectivist' approach. On this approach, a valued object is valuable objectively, *independently of any human valuations*. It would be argued that some objects, such as nature, are valuable on account of some objective characteristics that they possess, such as beauty, integrity, or harmony, and not on account of the value that outside valuers may attach to them.

In 1903 the philosopher G. E. Moore, who is usually regarded as a strong advocate of this objectivist view, invited us to make a famous thought-experiment concerning beauty. He asked us to imagine two worlds,

one in which all imaginable natural beauty exists: 'put into it whatever on this earth you most admire – mountains, rivers, the sea, trees, and sunsets, stars and the moon ... And then imagine the ugliest world you can possibly conceive. We then have to assume that neither of these worlds can ever possibly be seen by any human being.' Moore goes on to ask 'is it irrational to hold that it is better that the beautiful world should exist, than the one which is ugly' (Moore 1978: 83–4). The subjectivist would say that such a comparison would, indeed, be irrational. Moore, however, took the opposite view. If the choice was between the sheer existence of beauty and the sheer existence of ugliness, then, according to him, 'beauty must *in itself*, be regarded as a greater good than ugliness' and we must prefer its existence to that of ugliness (Moore 1978: 84; emphasis added).<sup>3</sup>

But Brian Barry (1999: 114) is surely right in saying that 'I have to say that the whole question [that is, Moore's question] strikes me as ridiculous. In what possible sense could the universe be a better or a worse place on one supposition rather than the other? It seems to me an abuse of our language to assume that the word "good" still has application when applied to such a context'.

In other words, it is difficult to imagine what beauty would be if it were not beauty as it presents itself to some consciousness. Thus Moore's experiment is fundamentally flawed. Imagining the world without humans is really imagining the world without their sense of beauty and other values. If, in Moore's experiments, we were allowed to be 'spectators', so to speak, but not 'actors' on the stage of the world, then of course it is plausible that as spectators we would choose a beautiful world rather than an ugly one. But if we are not allowed to be spectators either, then 'beauty' and 'ugliness' are terms that seem to be devoid of any significance.

The alternative route, which is the 'subjective' route, and which is the one that we followed in our discussion of intergenerational egalitarianism, is that values cannot exist without a valuer. In the example of Moore's two worlds, it does not make sense to talk about a beautiful world unless there is some valuer who perceives it as beautiful. But the subjectivist view of value by no means implies that the mere fact that something is valued by somebody means that it must be valuable to everybody.<sup>4</sup>

Furthermore, this so-called '*subjectivist*' approach to valuation, that is, requiring the existence of a valuer, does not prejudice the issue of which sort of

value the valuer would ascribe to the valued object. One can subjectively attribute either instrumental or intrinsic value to the object in question. For example, [...] some people may believe that greater equality between people is intrinsically valuable, and others may believe that it is only instrumentally valuable, for example, as a means of increasing social harmony. But both ways of valuing equality will be values held by people and neither need rest on a claim that the values in question are 'objective' values that exist independently of valuers. Thus, the subjectivist approach to valuation still allows the valuer to attribute *intrinsic* value to something.

How far values can be objective or subjective has been the subject of extensive speculation among philosophers for centuries. One classic discussion of this issue, by the late J. L. Mackie, began with the blunt statement: 'There are no objective values'. But, as he went on to explain, to some people this proposition appears outrageous while to others it appears as a trivial truth (Mackie 1988). Thus the problem of the objectivity or otherwise of values in general is a vast and complex problem to which we would not presume to attempt to contribute. Here we are concerned chiefly with the question of whether the environment or some parts of it can be the bearer of intrinsic values, and, if so, in what sense. This is a question for subjectivists as much as for those who subscribe to objective values. For where the value comes from and what possesses value are two different questions. As John O'Neill has pointed out, some of the confusion in the debate about intrinsic values arises out of a failure to distinguish between the *source* of value, for example human valuers, and the *object* of value – O'Neill's terminology, or *locus* of value in other people's terminology (J. O'Neill 1993: 11). For instance a common mistake is to assume that if we follow the subjectivist path, we are committed to the view that is despised by preservationists, namely, that nature can have only instrumental value to us. But, in fact, nothing prevents a subjectivist from attributing intrinsic value to nature or the preservation of the environment.

However, many environmentalists would not be satisfied with, let alone welcome, a subjectivist defence of the intrinsic value of nature. They believe it is unduly anthropocentric, and hence sells a crucial pass in the struggle to justify the intrinsic value of nature. It makes the status of nature too dependent on changes in human tastes and fashions or on differences in cultural norms. As is well-known, one of the dangers in the

subjectivist approach to valuation is that it can slip into moral relativism, that is, that what is morally 'good' may depend too much on the particular society or epoch with which we are concerned.

The same could apply to the valuation of nature. If all that matters is human appreciation of nature then one day our cultural ideals may change. The human race could become so culturally depraved that whereas it had previously regarded magnificent trees or forests as intrinsically valuable it now denied them intrinsic value and regarded plastic trees as more beautiful than real ones. All real trees would then be cut down except those required to satisfy minority tastes for quaint, old-fashioned wooden furniture or other useful purposes. Many environmentalists also share the view that 'In our enlightened times, when most forms of chauvinism have been abandoned, at least in theory, by those who consider themselves progressive, Western ethics still appears to retain a fundamental form of chauvinism, namely human chauvinism' (Routley and Routley 1979: 36).

### The Objectivist Defence of Nature's Intrinsic Value

A widely-used argument that brings out the character of the objectivist case for attaching objective intrinsic value to nature is the 'last man argument', which closely resembles Moore's famous thought-experiment discussed above.<sup>5</sup> This takes a form such as 'Suppose you were the last man on earth and knew that you were about to die as well, but you had it in your power to press a button that would destroy all the beautiful things that would otherwise be left behind – the mountains, the forests, the beautiful scenery, the animals, and so on. Would you do so?' Those who claim that the items in question have *objective* intrinsic value would argue that it would be immoral to do so even in the absence of human beings. It is not a question of whether such an act of wilful and pointless vandalism would be stupid and contemptible, about which we can all agree. The question is whether the beautiful things that would be left behind if the last person to leave did not destroy them would be valuable on account of their beauty or integrity or whatever.

A clear illustration of the weakness of the 'last man' argument is exposed if one pushes the thought-experiment a bit further. Suppose that after the last

man has departed, leaving behind the mountains and trees, and so on, perhaps in due deference to their intrinsic value and beauty, some aliens from outer space arrive on earth one day who have very different tastes from ours. They much prefer flat surfaces and find all these mountains and trees sticking up all over the place to be very ugly. Any philosophers among them who had previously espoused the 'last man' argument would be looking rather silly.<sup>6</sup>

Other arguments put up in defence of the objective view as applied to nature are equally unconvincing. For example, some environmental philosophers have argued that value is a concept that is applicable to any being that has a good of its own – for example, bamboo is 'good' for pandas, mild winters are 'good' for greenfly.<sup>7</sup> But this is a glaring example of the fallacy of equivocation: the word 'good' is being used in two entirely different senses. For even if certain inputs may be instrumentally 'good' for certain animals or inanimate objects in the sense that they may be necessary or sufficient conditions for them to flourish, this is a sense of the term 'good' that has nothing to do with being intrinsically morally 'good'. The mere fact that some living organism, like the tsetse fly or the HIV virus, or a more complex entity like an ecosystem, may flourish in particular conditions does not impose any moral obligation on humans to protect and promote those conditions.

There are other prominent avowedly objectivist defences of the intrinsic value of nature, but when it comes to the crunch they seem to sell crucial passes in that human interests and valuations enter by the back door. For example, Arne Naess, the founder of deep ecology, states that 'Richness and diversity of life forms ... are also values in themselves. Humans have no right to reduce this richness and diversity *except to satisfy vital needs*' (emphasis added).<sup>8</sup> But the 'vital needs' to which reference is made are, presumably, the vital needs of humans.

Similarly, 'deep green' theory adopts the principle that 'there should be no substantially differential treatment of items outside any favoured class or species of a discriminatory sort that *lacks sufficient justification*' (Sylvan and Bennett 1994: 142, emphasis added). Again, it is presumably humans who are to decide what is 'sufficient justification' and to weigh this against the value of the environment. Thus the qualifications about the moral legitimacy of sacrificing nature in the interests of satisfying vital human needs, or when there is sufficient justification, means that, in the end, humans are entitled to weigh up the

claims of the natural environment against any other claims that they think are vital. So we are once again relying on humans to weigh up competing claims on resources. In that case the concept of objective values outside the valuations made by humans can have no place.

All in all, therefore, the common environmentalist claim that nature is the bearer of some objectively intrinsic values seems difficult to defend. Indeed, the difficulty seems so great that those environmentalists who want to claim a privileged status for the environment would probably be on firmer ground if they defended the intrinsic value to the environment from a subjectivist point of view (O. O'Neill 1997: 128). In the end, objectivism may prove to be a liability to them rather than an asset, and some other, less metaphysically demanding view, such as that set out here [...], may better serve the cause of environmental protection.

### The Inevitability of Human-Centred Values

The objectivist case for regarding the environment, or parts of it, as the bearer of intrinsic value is closely linked, as already indicated, to the belief that the value of nature should not be seen from a purely anthropocentric viewpoint. But, in some fundamental sense, even objectivists are no less anthropocentric than those who believe that nature has purely instrumental value. For it is simply inevitable that, to whatever view we subscribe about the value of nature, it will always be our human view. There is no other perspective available to us and there is no other perspective that can be adopted in our treatment of the non-human world. Since 'anthropocentric' simply means 'seen from the standpoint of a human being', then all views about the status and value of nature are equally anthropocentric.<sup>9</sup>

There is also a certain tension between notions like 'biological egalitarianism' or 'eco-impartiality' and insistence on treating the human species on an equal footing with the other species. For if all species are to be treated equally why is the human species not allowed to act in the way that other species do, namely, in their self-interest? No other species respects the 'intrinsic' value of other forms of life. But we are expected to be different and, instead of safeguarding our own interests by displaying natural 'human chauvinism' in the way that lions display 'leo

chauvinism', we are expected to overcome this natural inclination of all species, and adopt what might be called 'species impartiality'.

Now the demand that human beings should cultivate sensibilities such that they treat 'nature' with due respect – but not more – seems to be perfectly legitimate. But it is so because of a clear affirmation of human superiority. No other species would be capable of conceiving of such a grand idea as the equality of species which requires it to rise above the natural limitations of its own species. As Bernard Williams points out, it is one of the stranger paradoxes in many people's attitudes to nature that

while they supposedly reject traditional pictures of human beings as discontinuous from nature in virtue of reason, they remind us all the time that other species share the same world with us on (so to speak) equal terms, and they unhesitatingly carry over into their picture of human beings a moral transcendence over the rest of nature, which makes us uniquely able and therefore uniquely obliged, to detach ourselves from any natural determination of our behaviour. Such views in fact firmly preserve the traditional doctrine of our transcendence of nature, and with it our proper monarchy of the earth; they merely ask us to exercise it in a more benevolent manner. (Williams 1992: 65)

As Bernard Williams (1992: 65) writes, 'a self-conscious concern for nature is not itself a piece of nature: it is an expression of culture'. And he goes on to explain that 'nature which is preserved by us is no longer a nature that is simply not controlled. A natural park is not nature, but a park; a wilderness that is preserved is a definite, delimited, wilderness. The paradox is that we have to use our power to preserve a sense of what is not in our power. Anything we leave untouched we have already touched'. And finally Williams warns us that in order to avoid self-deception we must not forget 'the inescapable truth that our refusal of the anthropocentric must itself be a human refusal' (1992: 68).

But being anthropocentric does not necessarily mean that we are 'human chauvinists', as is suggested in much environmentalist literature. For the term 'chauvinism', as usually employed in connection with attitudes to national or racial differences, suggests narrowness of sympathy, ruthlessness, and a callous indifference to the feelings of people of different national or racial affiliation. However, the philosophical position represented by, say, Passmore,

which is commonly described as anthropocentric, can hardly be accused of narrowness of sympathy. Passmore (1974: 187) openly admits that 'I treat human "interests" as paramount. I do not apologise for that fact'. But he strongly defends the need for the preservation of nature.

His humanism is of the hospitable, friendly type, as opposed to what Mary Midgley (1999: 111) calls 'exclusive humanism', or 'human chauvinism', which would be characterized by narrowness of sympathy. Her support for the friendly kind of humanism is unequivocal: '... there is a sense in which it is right for us to feel that we are at the centre of our own lives. Attempts to get rid of that sense would be doomed in the same way as stoical attempts to tell people not to care especially about themselves, or about those dear to them' (1999: 110). But, she adds, 'We need, then, to recognise that people do right, not wrong, to have a particular regard for their own kin and their own species' (1999: 111).

Thus, a concern with non-human components of the natural world – for example, other animal species, and plants – or with environmental preservation is by no means incompatible with an anthropocentric approach. Indeed, it may well be that an anthropocentric approach in terms of human obligations provides a stronger basis for environmental protection than does the ecocentric appeal to objective intrinsic values in the environment or the rights of the non-human world. For since obligations can be only human obligations, the anthropocentric approach seems to be unavoidable. Hence, it is argued, the benefits of diversity of species, as distinct from concern with individual animals or insects on the basis of other considerations, such as simple 'compassion', must be evaluated from a basically anthropocentric point of view.

## Notes

- 1 Callicott (1985: 271). See an excellent discussion of this feature of environmentalism in Sober (1986).
- 2 For example, Nozick (1981: 414) writes, 'The notion of value I wish to investigate is not the value of something for some other purpose or further effects or consequences (assumed to be valuable). It is not its instrumental value, but rather its value in itself, apart from these further consequences and connections. Philosophers have termed this type of value intrinsic value'. Sometimes, in the context of this sort of classification, 'instrumental values' are referred to as 'extrinsic values'.

- 3 At other points in the book, however, Moore appears to express doubts about this view. For example, he writes (1978: 28), without indicating any dissent, that 'It seems to be true that to be conscious of a beautiful object is a thing of great intrinsic value; whereas the same object, if no one be conscious of it, has certainly comparatively little value, and is commonly held to have none at all'. And he displays a certain amount of equivocation in writing 'I have myself urged in Chap. III that the mere existence of what is beautiful does appear to have *some* intrinsic value; but I regard it as indubitable that Prof. Sidgwick was so far right, in the view there discussed, that such mere existence of what is beautiful has value, so small as to be negligible, in comparison with that which attaches to the consciousness of beauty' (1978: 189). It is only the distinction between 'negligible' value in the absence of any consciousness and zero value that protects Moore from the charge of blatant inconsistency, and the distinction is very difficult to justify in the context.
- 4 Many people value things that most of us would regard as abhorrent, but it is probably true that such people would probably prefer to keep their 'values' quiet or deny that they had them, and this is probably largely because they know that the things that they value do not really have any moral value.
- 5 This was set out very forcefully by Richard and Val Routley (1980).
- 6 See also Elliott Sober's (1986: 190–1) powerful critique of the 'last man' argument.
- 7 See a useful discussion of this assertion and its advocates in J. O'Neill (1993: Ch. 2).
- 8 See Naess and Session's 'platform' quoted in Sikora and Barry (1978: 95).
- 9 As Luc Ferry (1995: 131) puts it in his criticism of deep ecologists, 'imagining that good is inscribed within the very being of things they forget that all valorization, including that of nature, is the deed of man and that, consequently, all normative ethic is in some sense humanistic and anthropocentric'.

## References

- Barry, B. (1999). 'Sustainability and Intergenerational Justice', in A. Dobson (ed.), *Fairness and Futurity*. Oxford: Oxford University Press.
- Callicott, J. (1985). 'Intrinsic Value, Quantum Theory and Environmental Ethics'. *Environmental Ethics*, 7/3: 257–75.
- Ferry, L. (1995). *The New Ecological Order*. Chicago: Chicago University Press.
- Mackie, J. L. (1988). 'The Subjectivity of Values', in G. Sayre-McCord (ed.), *Essays on Moral Realism*. Ithaca, NY: Cornell University Press.

- Midgley, M. (1999). 'The End of Anthropocentrism?', in R. Attfield and A. Belsey (eds), *Philosophy and the Natural Environment*. Cambridge: Cambridge University Press.
- Moore, G. E. (1978). *Principia Ethica*. Cambridge: Cambridge University Press.
- Nozick, R. (1981). *Philosophical Explanations*. Oxford: Clarendon Press.
- O'Neill, J. (1993). *Ecology, Policy and Politics*. London and New York: Routledge.
- O'Neill, O. (1997). 'Environmental Values, Anthropocentrism and Speciesism'. *Environmental Values*, 6/2: 127-42.
- Passmore, J. (1974). *Man's Responsibility for Nature*. London: Duckworth.
- Regan, T. (1992). 'Does Environmental Ethics Rest on a Mistake?'. *The Monist*, 75: 161-82.
- Routley, R. and Routley, V. (1979). 'Against the Inevitability of Human Chauvinism', in K. Goodpaster and K. Sayre (eds), *Ethics and Problems of the 21<sup>st</sup> Century*. Notre Dame: University of Notre Dame Press.
- Routley, R. and Routley, V. (1980). 'Human Chauvinism and Environmental Ethics', in D. Mannison, M. McRobbie, and R. Routley (eds), *Environmental Philosophy*. Canberra: Australian National University.
- Sikora, R. and Barry, B. (eds) (1978). *Obligations to Future Generations*. Philadelphia: Temple University Press.
- Sober, E. (1986). 'Philosophical Problems for Environmentalism', in B. Norton (ed.), *The Preservation of Species: The Intrinsic Value of Nonhuman Species*. Princeton: Princeton University Press.
- Sylvan, R. and Bennett, D. (1994). *The Greening of Ethics*. Cambridge: The White Horse Press.
- Williams, B. (1992). 'Must a Concern for the Environment be Centred on Human Beings?', in C. Taylor (ed.), *Ethics and the Environment*. Oxford: Corpus Christi College.