Toward a Systemic Ethic:
In Search of an Ethical Basis for
Sustainability and Precaution

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There are many different meanings of sustainability and precaution and no
evident connection between the new normative concepts and the traditional moral
theories. We seek an ethical basis for sustainability and precaution—a common
framework that can serve as a means of resolving the conceptual ambiguities of
the new normative concepts and the conflicts between new and traditional moral
concepts and theories. We employ a systemic approach to analyze the past and
possible future extension of ethics and establish an inclusive framework of ethical
extension. This framework forms the basis for what we call a systemic ethic.

I. THE MEANING OF SUSTAINABILITY AND PRECAUTION

There is an increasing focus on environmental and global issues in society
and this focus is reflected in the widespread use of concepts such as sustain-
ability and the precautionary principle. But what is the normative force of these
concepts? The environmental issues have not been systematically addressed by
philosophers until the last few decades.[1] And the new normative concepts still
pose a challenge to ethical theory.

The present paper originates in considerations on sustainability and precaution
in agricultural research—in particular with regard to organic agriculture, which
demonstrates an alternative agricultural practice and opens up for new perspec-
tives on nature. The scope of the paper is, however, not restricted to agriculture.
Environmental problems in agriculture involve complex ecological and bio-
physical processes, as well as human actors, their practices and preferences,
and the workings of social systems. Agriculture depends on natural processes
that can only to some degree be controlled by humans—in spite of a rapid
technological development. In these, and in many other ways, agriculture can

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[1] See K. E. Goodpaster and K. M. Sayre, "Introduction," in *Ethics and Problems of the 21st
Century*, ed. K. E. Goodpaster and K. M. Sayre (Notre Dame: Indiana: University of Notre Dame
Press, 1979), p. vii.

be taken as a fertile example for understanding the moral aspects of environ-
mental issues in general.

There is, however, no single, well-defined meaning of either sustainability
or precaution. The diversity of meanings of sustainability can be analyzed in
relation to different perceptions of nature. It is common to distinguish between
different "myths of nature," where nature is seen as robust or vulnerable in
terms of ecological resilience.[2] This diversity is related to the distinction
between weak and strong sustainability in environmental economics.[3] Strong
sustainability builds on two assumptions: that nature is (more or less) vulner-
able and that society is dependent on nature in terms of basic life support
services. As a result, it holds that man-made and natural capital cannot be
infinitely substituted. Weak sustainability assumes that they can, and it is
therefore essentially an economic concept that has no separate normative
content.

Agriculture brings in a new perspective on sustainability that has to do with
the *relationship* between humans and nature. Gordon Douglass has described
three different meanings of agricultural sustainability that are used by different
groups with different views and values.[4] Conventional agriculture mainly
speaks of sustainability in the sense of *food sufficiency*—sufficient food
production in relation to future needs. Agriculture is seen as an instrument for
feeding the world based on resource use, technological development, and
economic cost-benefit analysis. Sustainability as *stewardship* is concerned
with the ecological balance and the biophysical limits to agricultural produc-
tion, and therefore determines desirable population levels. In alternative forms
of agriculture, including organic farming, sustainability is mainly understood
as *community*. They share the concern for ecological balance, but with a focus
on the permanence and self-reliance of the agricultural system and on the social
organization and cultural values of rural life.

On this background, we can distinguish between two different kinds of
conceptions of the human relationship to nature. A *separative* kind that sees
humans as basically separate from nature, and a *systemic* kind that sees humans
as basically an integral part of nature. This distinction leads to three different

[2] See, e.g., C. S. Holling, "The Resilience of Terrestial Ecosystems: Local Surprise and Global
Change," and Peter Timmerman, "Mythology and Surprise in the Sustainable Development of the
Biosphere," in *Sustainable Development of the Biosphere,* ed. William C. Clark and R. E. Munn.
(Cambridge: Cambridge University Press, 1986); Michiel Schwarz and Michael Thompson,
Divided We Stand. Redefining Politics, Technology and Social Choice (New York: Harvester
Wheatsheaf, 1990), p. 5.

[3] E.g., Robert Goodland, "The Concept of Environmental Sustainability," *Annual Review of
Ecological Systems* 26 (1995): 1–24, and the recent paper in this journal by Robert U. Ayres,
Jeroen C. J. M. van den Berg, and John M. Gowdy, "Strong versus Weak Sustainability:
Economics, Natural Sciences, and 'Consilience,'" *Environmental Ethics* 23 (2001): 155–68,
where further references can be found.

[4] Gordon K. Douglass, "The Meanings of Agricultural Sustainability," in *Agricultural Sustain-
ability in a Changing World Order* (Boulder: Westview Press, 1984), 3–29.

views of nature. Within the separative conception of nature there are two opposite perspectives on the value of nature. In the culturist view of nature the controlled, well-ordered and cultivated nature is the good nature, while the naturalist view of nature values the wild, authentic and uncontrolled nature—nature untouched by man. The systemic perspective on nature can be characterized as an ecologist view of nature, which values the intimate and mutually benign relations between human and nature. (These generic terms do, of course, not preclude that an ecologist may have a naturalist view, etc.)

This threefold distinction can be used to identify the underlying views of evaluative and normative concepts that refer to nature and the environment, such as nature quality and sustainability. For instance, Douglass' food sufficiency takes a culturist view of nature, stewardship a naturalist view, and community an ecologist view. Another example is the distinction between two schools in the philosophy of nature conservation, compositionalism and functionalism,[5] which correspond to the naturalist and the ecologist view respectively.

Paul Thompson suggests a philosophical distinction between two approaches to agricultural sustainability.[6] *Resource sufficiency*, which corresponds to Douglass' food sufficiency, is an "accounting" approach that presumes the ability to measure and calculate the proper balance between present resource use and future needs in line with the discussion of strong and weak sustainability referred to above. *Functional integrity* presupposes the idea of a system having crucial elements, such as soil, crops, livestock, ecosystems, cultural values, and social institutions, that may be reproduced over time in a way that depends upon previous system states.

Thompson points out that ignorance is handled differently in the two approaches. Resource sufficiency is concerned with making predictions on the basis of available knowledge. Functional integrity emphasizes resilience based on a recognition of the limits of human knowledge. This difference forms a junction with the concept of precaution.

There are different approaches to precaution in society, based on different conceptions of human knowledge and control, which involve different ways of handling uncertainty and ignorance.[7] Conventional rational decision making involves risk assessments and cost-benefit analyses that support acting in proportion to the calculated risks or, more generally, the expected utility. This approach can be called "rational precaution" (in the same sense as "rational

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[5] J. Baird Callicott, Larry B. Crowder, and Karen Mumford, "Current Normative Concepts in Conservation," *Conservation Biology* 13, no. 1 (1999): 22–35.

[6] E.g., Paul B. Thompson, "Sustainability As a Norm," *Society for Philosophy and Technology* 2, no. 2 (1996): 75–93. The concept of functional integrity can be used in relation to any system with an internal, self-sustained purpose or an external, imposed purpose.

[7] See, e.g., Silvio O. Funtowitcz and Jerome R. Ravetz, "Science for the Post-Normal Age," *Futures* 25, no. 7 (1993): 739–55; Michael Smithson, "Ignorance and Science: Dilemmas, Perspectives and Prospects," *Knowledge: Creation, Diffusion, Utilization* 15 (1993): 133–56.

choice theory"). It is based on the available scientific knowledge and ignores ignorance—ignorance with regard to causal consequences and the values and preferences of those who might be affected. A different approach, known as the precautionary principle, has emerged in the context of environmental law.[8] This approach can be called "reflexive precaution." It involves reflections on the limits of scientific knowledge and control, and deliberate strategies for handling ignorance and uncertainty. According to the precautionary principle, the responsibility toward future as well as present generations obliges us to preserve the natural basis of life and avoid irreversible changes with unforesee-able consequences. The principle requires that preventive action be taken (e.g., by saying no to unpredictable technological activities) when there is a possibility of severe or irreversible damage to the environment. In other words, decisions makers must act in advance of conclusive scientific evidence of the danger. This strategy is supplemented with the development of society's capacity for early detection of dangers through comprehensive research, and the development and promotion of cleaner technologies.[9]

In the present paper we seek an ethical basis for sustainability and precaution.[10] A common framework that can serve as a means of resolving the conceptual ambiguities in the practical use of the new normative concepts and as a means of resolving conflicts between new and traditional moral concepts and theories. The method that is employed here is to analyze the past and possible future extension of ethics and establish an inclusive framework of ethical extension. The extension of ethics has been driven by the increased awareness of, for instance, the similarities and relations between human and other living beings and the growing human influence on natural systems and processes, and by the increased human potential for acting morally in keeping with this awareness. In accordance with this awareness, the analysis is characterized by a systemic approach based on a systemic conception of nature, and the established framework forms the basis for what we call a *systemic ethic*.

There is a traditional distinction between non-consequentialist ethics, which focus on the intention or motivation behind the act (such as character, virtues, duties), and consequentialist ethics, which focus on the consequences of the act (such as utility). The distinction can be illustrated by a simple model of moral acting:

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[8] See, e.g., Tim. O'Riordan and James Cameron, eds., *Interpreting the Precautionary Principle* (London: Earthscan, 1994); Carolyn Raffensperger and Joel Tickner, eds., *Protecting Public Health and the Environment. Implementing the Precautionary Principle* (Washington, D.C.: Island Press, 2000).

[9] This interpretation of the precautionary principle is based on Sonja Boehmer-Christiansen, "The Precautionary Principle in Germany: Enabling Government," in O'Riordan and Cameron, *Interpreting the Precautionary Principle*, p. 37.

[10] See also the discussion of sustainability as a system-describing and a goal-prescribing (normative) concept in Paul. B. Thompson, "The Varieties of Sustainability," *Agriculture and Human Values* 9 (1992): 11–19.

(moral agent) intentions → acts → consequences (moral object)

We need to go beyond this distinction to understand sustainability and precaution, because both these traditions are insufficient in front of the rapid technological development and the limited knowledge of the consequences of new technology. In particular, there is a need to go beyond the individualism and rationalism of classical humanist and utilitarian ethics,[11] towards an ethic that incorporates the present understanding of social and ecological systems and which emphasizes responsible acting rather than intentions or consequences.

II. THE EXTENSION OF MORAL CONSIDERABILITY

The historical roots of ethics are found in the relations between the individual and the members of the local community. Ethics concerned the direct dealing of man with man, including the dealing with himself. From today's viewpoint, history shows an extension of ethics from the consideration for one's fellows towards the inclusion of equal men, slaves, women, and, more recently, all human beings, future people, and sentient beings. In order to fully analyze this past extension of ethics and the possible future extension, we need to look at the different aspects of ethical acting in some detail and discriminate between different dimensions of the extension.

In the history of Western culture, ethics was mostly anthropocentric and symmetrical. Those who were taken into ethical consideration were themselves capable of moral action. This symmetry is expressed in the so-called golden rule of ethics (here from the gospel of Matthew): "In everything, do to others what you would have them do to you." In the very influential ethics of Immanuel Kant, there is also a symmetrical foundation, expressed in his well-known single categorical imperative of morality: "Act only on that maxim which you can at the same time will, that it should become a universal law."[12] A universal symmetrical ethics such as Kant's, entailing that all those capable of moral action, and only those, are worthy of moral consideration, can provide a rationale for an extension of ethics beyond one's fellows, but it also precludes the extension of moral considerability beyond persons (rational beings) to, for instance, young children and mentally disabled humans. Hence, the humanitar-

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[11] Kenneth E. Goodpaster, "From Egoism to Environmentalism," in in Goodpaster and Sayre, *Ethics and Problems of the 21st Century*; Jeffrey Burkhardt, "The Morality behind Sustainability," *Journal of Agricultural Ethics* 2 (1989): 113–28.

[12] Immanuel Kant, *Fundamental Principles of the Metaphysics of Morals* (1785), second section. *Maxim* here means the principle on which the subject acts, in distinction from the principle on which it ought to act, that is, an imperative or a practical law. The imperative is "categorical" in the sense that it is a logical condition for mutual obligations between rational beings. The rationale behind Kant's categorical imperative presumes a symmetrical ethics. Without symmetry, the imperative would not be categorical.

ian movement in itself entailed an extension beyond the symmetrical ethics, because it included consideration for all humans.[13]

This extension necessitates the distinction between *moral responsibility*, concerning the moral agent, and *moral considerability*, concerning the object of moral consideration. It leaves open the possible extension of moral considerability to those incapable of moral action. It also allows for a separate inquiry into the space of moral responsibility (see further in section 5).

There are different approaches and arguments to the question of where the limit of moral considerability is to be drawn. The history of ethics shows some exceptions to the dominance of anthropocentric ethics, such as the Epicureans who took the good to be pleasure and recognized that animals as well as humans were capable of feeling pleasure and pain.[14] In most cases, however, the concern for animals was based on concern for the ensuing effects on human morals. Explicit ethical concerns for higher animals were raised in the late eighteenth century and in the nineteenth century, for example in the utilitarian ethics of Jeremy Bentham, but only in the 1970s did animal rights become a serious and much debated philosophical subject.[15]

Environmental ethics has been concerned with the further extension of moral considerability, to living beings in general, ecosystems or "Nature."[16] Many different kinds of ethics may entail an environmental ethic in the sense of "a concern for the human environment." William K. Frankena lists eight different "ethics about the environment" with different spheres of considerability, arguing that each can entail an environmental ethic.[17] The first five are characterized by still wider spheres, the limits being: (1) oneself, (2) humans or persons, (3) sentient beings, (4) living beings, (5) everything. Type 6 includes only God as a moral object, type 7 includes God and one of the first five types, and type 8 includes only nature. These environmental ethics will, as Frankena readily admits, be different, and he casts his vote on an ethics where only sentient beings are morally considerable, leaving the rest of the environment to be considered as values in relation to humans and sentient beings. Frankena's point is that we may very well decide to protect the environment

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[13] However, deeming all human beings to be worthy of moral consideration and excluding other sentient beings seems to be difficult to defend against a charge of human chauvinism, or 'speciesism' as Peter Singer has called it. See, e.g., Richard Routley and Val Routley, "Against the Inevitability of Human Chauvinism," and Peter Singer, "Not for Humans Only," in Goodpaster and Sayre, *Ethics and Problems of the 21st Century*. See further in section 6.

[14] Lawrence E. Johnson, *A Morally Deep World. An Essay on Moral Significance and Environmental Ethics* (Cambridge: Cambridge University Press, 1991), p. 16.

[15] Roderick Frazier Nash, *The Rights of Nature. A History of Environmental Ethics* (Madison: University of Wisconsin Press, 1989), p. 137.

[16] E.g., Kenneth E. Goodpaster, "On Being Morally Considerable," *Journal of Philosophy* 75 (1978): 308–25; Paul Taylor, *Respect for Nature: A Theory of Environmental Ethics* (Princeton: Princeton University Press, 1986).

[17] Willam K. Frankena, "Ethics and the Environment," in Goodpaster and Sayre, *Ethics and Problems of the 21st Century*.

because it is of value to us, while not acknowledging any *moral* consideration for non-sentient beings. (The relation between value and moral value is discussed further in section 7.)

Type 8 in Frankena's list of ethics is ambiguous as to whether nature is to be left alone (the naturalist view of nature) or to be cooperated with, followed and imitated (the ecologist view). It is therefore not very helpful as a moral guideline. The other seven ethics focus on individuals, and the moral considerability of ecological systems comes in only as an appendix to the considerability of "everything" (type 5). Since the considerability of "everything" is next to a *reductio ad absurdum* of the idea of an extension of moral considerability, Frankena's structuring of environmental ethics is not favorable to the idea that ecosystems might deserve moral consideration. Views of moral considerability that focus solely on individuals cannot form a sufficient basis for a systemic normative concept, such as the functional integrity conception of sustainability.

Kenneth Goodpaster has argued that the two major foundational accounts of morality of the modern period—the "Humean" family of utilitarian ethics in which moral predicates are derived from the interests of individuals, and the "Kantian" family where ethical imperatives are derived from the rational generalization of the intrinsic worth of individual beings—share a basic "individualistic" model of moral sentiment or reason.[18] Goodpaster further states that when the individualistic model is the only model available, "its implausibilities will keep us from dealing ethically with environmental obligations or ideals altogether." He urges that we, in a sense, "return to the richer Greek conception of a man by nature social . . . —though it goes beyond the Greek conception in emphasizing that societies too need to be understood in a context, an ecological context, and that it is this larger whole which is the 'bearer of value.'" [19]

III. INDIVIDUALISTIC AND SYSTEMIC
APPROACHES TO MORAL CONSIDERABILITY

Two perspectives on the extension of ethics are of particular interest in relation to sustainability, because they involve a systemic approach to ethics. They are the ecological and the technological perspective, represented here by Aldo Leopold and Hans Jonas respectively. Leopold took ethics to be a body of self-imposed limitations on freedom of action, based on the recognition that the individual is a member of a community of interdependent parts. In "The Land Ethic" he described the historical extension of ethics from tribal members to men from other tribes and races, and to slaves and women, and argued for a further extension to the "biotic community":

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[18] Goodpaster, "From Egoism to Environmentalism," p. 22.
[19] Ibid., pp. 29–30.

> The land ethic simply enlarges the boundaries of the community to include soils, waters, plants and animals, or collectively: the land. . . . The extension of ethics to this . . . element in human environments is, if I read the evidence correctly, an evolutionary possibility and an ecological necessity.[20]

While Leopold is regarded as the most important source of modern biocentric or holistic ethics,[21] there were important precursors to his evolutionary account of ethics, such as William E. H. Lecky and Charles Darwin.[22] Darwin wrote on the social nature of ethics in "The Descent of Man":

> Finally the social instincts, which no doubt were acquired by man as by the lower animals for the good of the community, will from the first have given to him some wish to aid his fellows, some feeling of sympathy, and have compelled him to regard their approbation and disapprobation. Such impulses will have served him at a very early period as a rude rule of right and wrong. But as man gradually advanced in intellectual power, and was enabled to trace the more remote consequences of his actions . . . [and as] his sympathies became more tender and widely diffused, extending to men of all races, to the imbecile, maimed, and other useless members of society, and finally to the lower animals,—so would the standard of his morality rise higher and higher.[23]

But still, Leopold's "biotic community" was a radical, novel conception in ethics, because it took a distinctly systemic perspective on man as part of nature, spurred by ecological science. As J. Baird Callicott succinctly states it: ". . . ecology changes our values by changing our *concepts* of the world and of ourselves in relation to the world."[24]

Darwin's mention of the ability to "trace the more remote consequences of actions" points toward the other systemic approach, the ethics of technology. In the traditional ethics the right way of acting was determined from the immediate consequences, and far and future effects were left to the workings of chance, fate or providence. No one was held responsible for the unintended long-term effects of his or her well-intentioned, well-considered and well-performed acts.[25] Today, the traditional ethics of face-to-face encounters is

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[20] Aldo Leopold, *A Sand County Almanac* (Oxford: Oxford University Press, 1949), pp. 203–04.

[21] E.g., Frederick Ferré, "Persons in Nature: Towards an Applicable and Unified Environmental Ethics," *Ethics and the Environment* 1, no. 1 (1996): 15–25; J. Baird Callicott, "Elements of an Environmental Ethic: Moral Considerability and the Biotic Community," *Environmental Ethics* 1 (1979): 71–81.

[22] Nash, *The Rights of Nature,* p. 68.

[23] Charles Darwin, *The Descent of Man, and Selection in Relation to Sex* (1871), chap. 4.

[24] J. Baird Callicott, "Hume's Is/Ought Dichotomy and the Relation of Ecology to Leopold's Land Ethic," *Environmental Ethics* 4 (1982): 163–74; p. 174.

[25] Hans Jonas, *The Imperative of Responsibility: In Search of an Ethics for the Technological Age* (Chicago: University of Chicago Press, 1984), pp. 5–6.

insufficient due to the range of consequences and the magnitude of risks associated with the technological development.

> Modern technology has introduced actions of such novel scale, objects, and consequences that the framework of former ethics can no longer contain them. . . . No previous ethics had to consider the global condition of human life and the far-off future, even existence, of the race.[26]

According to Jonas, the expansion of human power through the collective practice of technology has created an ethical vacuum, and "novel powers to act require novel ethical rules and perhaps even a new ethics."[27] Jonas summarizes the new duties that correspond to our new powers in his theory of *responsibility*—responsibility is a correlate of power.[28]

The expansion of the range and impact of our collective actions and our increased awareness of possible far and future consequences moves the principle of responsibility into the very center of ethics. But before continuing the analysis of responsible acting (in section 5), we first investigate the systemic approach to moral considerability in more detail.

Callicott made a sharp distinction between the animal liberation movement and an environmental ethics in the tradition of Leopold's land ethic.[29] The extension of ethics to sentient animals in the animal rights movement is individualistic, in the same way as traditional humanism, while the Leopoldian environmental ethics is holistic, locating ultimate value in the biotic community: "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends to do otherwise."[30]

In line with Goodpaster and Callicott we distinguish between two different paths of extension of moral considerability: an *individualistic* extension in kind and a *systemic* community extension. The individualistic considerability can be extended in the familiar way from the individual moral agent to others of—more or less—the same kind: fellows, persons, human beings, sentient beings, living beings, and things. The possible systemic extension moves along a different path: from individual to family (perhaps including family animals, such as hunting dogs, horses, livestock, or pets), and further to the local and the global biotic or ecological community (the land and the humans, animals, plants, and other beings living on the land), and the universe. Sustainability as

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[26] Ibid., pp. 6, 8.

[27] Ibid., pp. 22–23.

[28] Self-awareness is the basis for responsible acting—the awareness of a choice of action implies moral responsibility. But note that a genuine choice of action requires that the ability to act responsibly is within reach.

[29] J. Baird Callicott, "Animal Liberation. A Triangular Affair," *Environmental Ethics* 2 (1980): 311–38.

[30] Leopold, *Sand County Almanac*, pp. 224–25.

functional integrity can be seen as a moral principle that is based on such an extension of systemic moral considerability.

While this distinction between an individualistic and a systemic path of extension of moral considerability is in line with recent trends in ethics, some justification is needed as to why this distinction is more than a contingent one. Goodpaster framed the central problem of modern ethics as the problem of overcoming egoism.[31] The justification provided here is based on there being two separate ways of "overcoming egoism" in line with the eighteenth-century discussion of moral sense, which distinguished between "enlightened self-interest" and "disinterested benevolence." The two ways of overcoming egoism are ways of "extending the self": an (individualistic) extension by way of identification with other individual selves and a (systemic) extension by way of expanding the boundary of ones own self.

IV. TWO WAYS OF "EXTENDING THE SELF"

In his social theory of the self, George Mead has described the "I" and the "me" as different aspects of the self (that is, the self seen from different perspectives) in the process of self-consciousness.[32] The "I" is the actor as well as, but not at the same time as, the observer of the "me." Or in other terms, the "me" is the self as an object—that which is presented to the "I" as self. This view is based on a social conception of self, where the self that consciously stands over against other selves thereby becomes an object, an other to him or herself.[33] Mead's theory of the social self lends itself directly to the *individualistic* path of extension of moral considerability, since self-awareness entails the ability to see oneself as another by way of taking another's point of view on oneself and one's actions and, hence (by inference from this knowledge of oneself as object *and* subject to the subjects of similar objects), an ability to see others as oneself—as autonomous subjects with interests more or less like oneself. In other words, the individualistic moral considerability is based on identifying with the other as an "I" in certain respects.[34]

The rational acknowledgement that another is a subject with interests like oneself forms a basis for identifying with the other and thus for feelings of sympathy, empathy, or love—this is the way of "disinterested benevolence." Jonas says that "it is indeed of the essence of our moral nature that the appeal, as insight transmits it, finds an answer in our feeling. It is the feeling of responsibility." He continues:

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[31] Goodpaster, "From Egoism to Environmentalism."

[32] George H. Mead, "The Social Self," *Journal of Philosophy, Psychology and Scientific Methods* 10 (1913): 374–80, pp. 374–75. See also Kant's *Critique of Pure Reason, Transcendental Dialectics,* bk. 2, chap. 1, where Kant distinguishes the "I" as a subject from the "I" as an object.

[33] Mead, "The Social Self," p. 377.

[34] See also Arne Næss, *Ecology, Community and Lifestyle* (Cambridge University Press, 1990) on the process of identification and the extension of the self.

. . . ethics has an objective side and a subjective side, the one having to do with reason, the other with emotion. . . . the two sides are mutually complementary and both are integral to ethics itself. Without our being, at least by disposition, responsive to the call of duty in terms of feeling, the most cogent demonstration of this right, even when compelling theoretical assent, would be powerless to make it a motivating force.[35]

The *systemic* expansion of the self rests on the perception of "the other" as being, in a certain respect, part of oneself—included in an expanded ecological or relationary perception of self. In an ecological understanding of humans as part of nature, the self is a center of organization, with Paul Shepard's term, constantly drawing on and influencing the surroundings, and there is no sharp boundary between self and not self. In the words of Alan Watts, inspired by Eastern philosophy: "The world is your body."[36] Callicott quotes Holmes Rolston's meditations on a lake shore:

The waters of North Inlet are part of my circulatory system; and the more literally we take this truth the more nearly we understand it. I incarnate the solar energies that flow through this lake. No one is free-living. . . . *Bios* [life] is intrinsically symbiosis.[37]

Callicott continues:

As one moves, in imagination, outwardly from the core of one's organism, it is impossible to find a clear demarcation between oneself and one's environment. . . . Ecology, thus, gives a new meaning as well as new substance to the phrase "enlightened self-interest."[38]

In Mead's terms, this movement can be seen as based on an expansion of "me"—of the moral agent's representation of "myself" as an object. We can thus consider the local community and the wider ecological system as part of an expanded "me." The rational acknowledgement that "the other" is part of an expanded "me" forms a basis for identifying (in a different sense from above) with the larger system and thus for feelings of self-love—and this is the way of "enlightened self-interest."

The two ways of extending the self forms a foundation for extending moral considerability along two different paths, an individualistic and a systemic. The two perspectives may also be combined so that the moral consideration for

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[35] Jonas, *The Imperative of Responsibility*, p. 85. See also David Hume's Inquiry concerning the principles of morals, Appendix I, on moral sense.

[36] Cited in J. Baird Callicott, "The Metaphysical Implications of Ecology," *Environmental Ethics* 8 (1985): 313.

[37] Holmes Rolston, III, "Lake Solitude: The Individual in Wildness," *Main Currents in Modern Thought* 31 (1975): 122.

[38] Callicott, "The Metaphysical Implications," pp. 314, 316.

an individual includes the systemic consideration based on that subject's perspective.

V. TOWARD AN INCLUSIVE FRAMEWORK
FOR ETHICAL EXTENSION

Above we have distinguished between moral responsibility and moral considerability, and discussed the individualistic and systemic ways of extending moral considerability. This account is, however, not a sufficient framework for discussing the normative aspects of sustainability and precaution. In Jonas' theory of moral responsibility the extension of ethics is linked to the expansion of the range of our technological actions and of our knowledge of far and future consequences—uncertain as it is.[39] Taking responsible acting as the basis for the analysis of the extension of ethics (instead of moral considerability) calls for a broader ethical framework. In this light, it is evident that we need to distinguish further dimensions of moral extension, apart from responsibility and considerability, in order to establish an inclusive systemic framework for ethics. But it is not clear exactly what constitutes those dimensions.

In order to determine the relevant dimensions in which an extension of ethics may take place, we need to elaborate on the simple model of moral acting presented in section 1. The new model, shown in figure 1, is a second-order cybernetic model of moral acting.[40] Based on this model, four dimensions of ethical extension can be identified (shown in figure 2). The four dimensions correspond to four elements of the model of moral acting in figure 1: the moral agent, the moral object, the acts and consequences, and the grounds of action (intentions, observation, and self-observation).

The dimension of *moral considerability,* which refers to the moral object, has already been discussed in some detail above. The dimension of *moral responsibility* refers to the moral agent. It is therefore constrained to self-aware beings and cannot be extended in the way of considerability (to sentient beings, for instance). Accordingly, moral responsibility has traditionally been understood as individual or *personal* responsibility. But the growing complexity of human society and the dramatic development of collective technological action

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[39] Jonas, *The Imperative of Responsibility.*

[40] The model of moral acting is based on the theories of second-order cybernetics and self-referential systems. Second-order cybernetics is concerned with accounting for the observer in the observation of cybernetic systems, see Heinz von Foerster, *Observing Systems* (Seaside, Calif.: Intersystems Publications, 1984), p. 258. An account of the development of systems theory from the distinction between "*w*holes and parts," to "system and environment," and to a theory of self-referential systems is given by Niklas Luhmann, *Social Systems* (Stanford: Stanford University Press, 1995), pp. 5–11. The model corresponds to the general model of a cognitive system that is presented in H. F. Alrøe, "Science as Systems Learning: Some Reflections on the Cognitive and Communicational Aspects of Science," *Cybernetics and Human Knowing* 7, no. 4 (2000): 57–78.
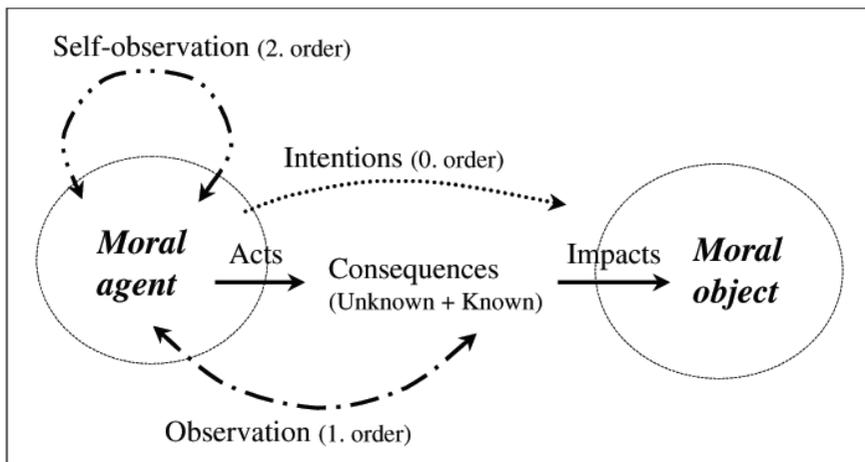
Fig. 1. Second order cybernetic model of moral acting.
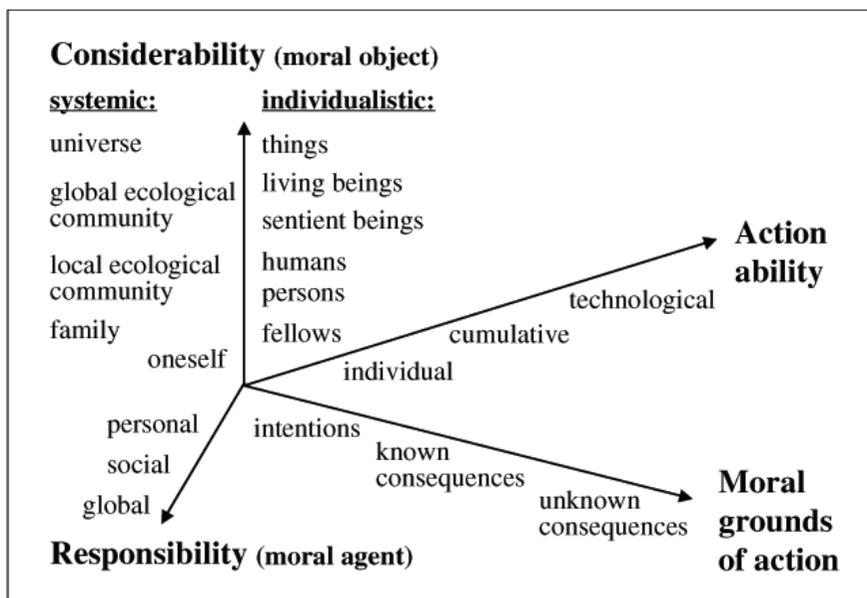
Fig. 2. Framework for ethical extension.

abilities give reasons for considering human societies, organizations, and corporations as moral agents.[41] In accordance with such a view, we can speak of the

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[41] Hans Lenk, "Distributability Problems and Challenges to the Future Resolutions of Responsibility Conflicts," *Society for Philosophy and Technology* 3, no. 4 (1998): 69–93; Sytse Strijbos,

collective *social* responsibility of such social systems—and of the demand for developing social systems that can take on a *global* responsibility.[42] In this vein, Sytse Strijbos asks: "What societal agents are responsible for particular developments? How are the different responsibilities of the agents related to each other and how are they coordinated?" and suggests that "what can be of help here is a systems view of technology that clarifies the interweavement between human actions at the various systems levels and the responsibilities that belong to a variety of agents at these levels."[43]

The third dimension, *action ability,* refers to the types of acts and consequences that the agent has the power to initiate. In line with Jonas, the polluter pays principle from environmental policy can be seen as a moral principle that is based on the ethical dimensions of human action ability and moral responsibility. Action ability may be *individual*, *cumulative* (involving more of the same kind of individual actions, such as in an increase of the human population size), or *technological*—that is, involving new kinds of human action.[44] For instance, the so-called "tragedy of the commons" is a moral aspect of the cumulative consequences of individually harmless actions. On the other hand, the technological development in agriculture, for instance, in terms of machines, chemical engineering, biotechnology, and genetic engineering introduces entirely new kinds of human action into the world. Technological actions are essentially collective actions of social systems. In the words of Strijbos: "Technology is no longer simply a matter of objects in the hands of individuals; it has become a very complex system in which our everyday lives are embedded. The systemic character of modern technology confronts us with relatively new questions and dimensions of human responsibility." [45]

The fourth dimension, *moral grounds of action,* concerns the type of grounds that the agent employs in moral acts. The primary grounds of action are always *intentions*, broadly construed as including the representation of the object, the motivations of the agent, and moral principles of acting. The intentions are non-cybernetic (0. order, see figure 1). That is, there is no "feedback" to the moral agent. The intentions can be altered if the *known consequences* and impacts, which are exposed by (1. order) observations, are included as moral grounds of action. Moreover, the *unknown consequences* and impacts can be

"Ethics and the Systemic Character of Modern Technology," *Society for Philosophy and Technology* 3, no. 4 (1998): 19–34.

[42] Holmes Rolston, III, *Environmental Ethics* (Philadelphia: Temple University Press, 1988), p. 247; Hans Lenk, "Progress, Values and Responsibility," *Society for Philosophy and Technology* 2, nos. 3–4 (1997): 102–19, p. 107.

[43] Strijbos, "Ethics and the Systemic Character," p. 28, in a discussion of Jonas' ethics of technology.

[44] Jonas, *The Imperative of Responsibility*. Lenk, "Progress, Values and Responsibility," p. 108: "In proportion to its powers, technologically multiplied to an extreme, humankind's responsibilities have grown if not exploded."

[45] Strijbos, "Ethics and the Systemic Character," p. 19.

included as a third type of moral grounds of action, based on the acknowledgement of the limits of observation and knowledge that are revealed by (2. order) self-observation or self-reflexivity. Including unknown consequences diminishes the moral importance of the known consequences, and therefore increases the importance of intentions and principles of moral acting, but it also provides a new basis for critical reflection on the intentions and principles of acting.[46]

The inclusion of ignorance and uncertainty as a moral ground of action combined with the growing action ability has many implications. The ("re-straining") responsibility for preventing possible unwanted consequences is one implication—as exemplified in the use of the principle of precaution in environmental policy. It also plays an important role in understanding the different ways that the concept of sustainability is used, as evident in the previously mentioned distinction between resource sufficiency and functional integrity. Another implication concerns the ("intervening") responsibility to utilize the new action abilities to help and protect those in need. Here the limits of knowledge and control caution against active interference where the consequences of the intervention cannot be foreseen. With reference to the model of moral acting in figure 1, it is clear that the *impacts* on the object of moral consideration are even harder to observe than the consequences of ones acts, because the impacts depend on the interests, well-being, or integrity of the moral objects. And these cannot be fully known from outside. With respect to human welfare this problem can to some degree be circumvented by way of linguistic communication. But for other kinds of moral objects we are left with the knowledge of our ignorance as a moral ground of action.

We use the term *systemic ethic* to designate an ethical stance that includes all the systemic aspects of ethical extension in the framework—systemic considerability, social responsibility, technological action ability, and and the limits of knowledge as a moral ground of action. Some of the implications and pertinent questions of a systemic ethic will be discussed briefly in the last sections, including a discussion of the relation to some more familiar concepts within environmental ethics, such as nonanthropocentrism and the intrinsic value of nature.

VI. NONANTHROPOCENTRISM, EQUITY, AND MORAL SIGNIFICANCE

In environmental ethics the extension of ethics is often discussed in terms of anthropocentrism and nonanthropocentrism. The traditional anthropocentric

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[46] See also Peter A. French, *Collective and Corporate Responsibility* (New York: Columbia University Press, 1984), p. 132, where he proposes an extended principle of accountability, according to which somebody is morally responsible not only for intentional acts, but also for unintended effects, which they *should* have known.

view is a position within an individualistic, humanistic ethics, and nonanthropocentric views indicate an extension of moral considerability beyond the limits of anthropocentrism (it is, however, often not made clear whether the limit of considerability is drawn at persons, in a symmetrical ethics, or at humans, even though these two positions are philosophically very different). *Nonanthropocentric* is the general term for an extension beyond persons or humans, and there are a number of more specific concepts such as pathocentric (from *pathos:* suffering, experience, emotion), biocentric, and ecocentric. *Pathocentric* and *biocentric* correspond to including, respectively, sentient beings (leaving the definition of *sentient being* as a subject for further discussion) and living beings into moral considerability. *Ecocentric,* on the other hand, is not nonanthropocentric in the sense of extending individualistic considerability. It involves the extension of systemic considerability. Hence, even though the nonanthropocentric concepts are apt and widespread in use, the distinction between individualistic and systemic considerability as two different ways of extending moral considerability, allows for more precise indications of ethical positions and thus for more clarity in the theoretical discussions.

Furthermore, the nonanthropocentric terms tend to conflate the issues of extension and equity, because the suffix *centric* implies not only an extension of considerability but also a shift of moral significance. *Pathocentric,* for instance, indicates that pigs and persons are of equal moral significance. *Ecocentric* indicates the primacy of ecological systems or *Nature* over individuals.[47] This implicit shift of moral significance is rightfully criticized for justifying acts that are inhumane in the sense of being unjust to persons.[48] As Goodpaster suggests, we need to distinguish between *moral considerability* and *moral significance*.[49] Moral considerability deals with the extensional aspect of equity (what kinds of moral objects enter into our considerations of equity?) while moral significance deals with the justice aspect (what does equity between these objects mean?). Extending moral considerability does not imply any position on moral significance—apart from the obvious that the extension of considerability determines the sphere within which we can discuss moral significance.

According to Singer, species membership is not a relevant reason for treating nonhumans different from humans.[50] His concept of "animal liberation" points out the analogy between the unjust, unequal treatment of slaves, of women, and of animals on farms and labs. But even though all sentient beings, for instance,

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[47] Note the connection between some ecocentric views and the naturalist view of nature in section 1.

[48] E.g., Ferré, "Persons in Nature," and Kristin Shrader-Frechette, "Individualism, Holism and Environmental Ethics," *Ethics and the Environment* 1, no. 1 (1996): 55–69; p. 63.

[49] Goodpaster, "On Being Morally Considerable," pp. 311–12.

[50] Singer, "Not for Humans Only," pp. 194–95.

are considered morally considerable, sentient and self-aware beings need not be considered of equal moral significance. Treating pigs and persons alike must be judged unjust if self-awareness is included as being of moral relevance, because equity then means treating persons differently from sentient beings without self-awareness.[51] Justice in the Aristotelian sense means proportional treatment where like instances are treated alike[52]—the crucial question is which similarities and differences are considered relevant.

In order to distinguish the just from the unjust differences, we suggest some guidelines for the relevance of differences in moral significance. Equity, in the present framework, is associated with either individualistic or systemic significance. Individualistic significance involves empirical questions concerning general differences between kinds of beings (sometimes discussed in the form of levels of being[53]). The relevance of a difference depends on whether it is related to the individuals well-being, sense-ability, or level of awareness. In the systemic perspective, it is difficult to speak of the well-being of ecosystems, for instance, since there seems to be limited empirical support for an organismic view of ecosystems.[54] Instead, systemic significance involves empirical questions concerning the relative functional importance of different processes of social and ecological dynamics (often discussed in terms of sustainability). The relevance of a difference in systemic significance depends on whether it is related to the functional integrity of the system—that is, the structure of relations, processes, and "memory structures" that sustains the system.[55]

Some kinds of living beings and physical processes, which we consider of little or no individual moral significance, are of great systemic moral significance with regard to the functional integrity of the ecological community. Any single individual, or group of individuals, has very limited systemic significance, unless they are the bearers of a functional role in the system and therefore play a key role in sustaining the system or a subsystem. In this way the significance of, for instance, the remaining individuals of a threatened species can increase.

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[51] See Donald VanDeVeer, "Interspecific Justice and Intrinsic Value," *The Electronic Journal of Analytical Philosophy* 3 (1995): 7, for a more detailed discussion of just differential treatment in relation to intrinsic value.

[52] Aristotle, *Nichomachean Ethics,* trans. W. D. Ross, bk. 5, sec. 3.

[53] See, e.g., Rolston, *Environmental Ethics*, pp. 223–24.

[54] See Johnson, *A Morally Deep World*, for an elaboration of such a view, and critiques by e.g., Robin Attfield, *Value, Obligation and Meta-Ethics* (Amsterdam: Edition Rodopi, 1995), p. 24, and Shrader-Frechette, "Individualism, Holism," p. 59.

[55] Note, however, that the systemic extension involves going beyond the "instrumental" view of the system. In this context, the limits of knowledge need to be taken into consideration when evaluating moral significance. An instrumental view of the system can be found in both anthropocentric and nonanthropocentric individualistic ethics, see, e.g., Bryan G. Norton, "Epistemology and Environmental Values," *The Monist* 75, no. 2 (1992): 208–26, and Taylor, *Respect for Nature.* See also Norton's convergence hypothesis (p. 209), which states the equivalence of nonanthropocentric and anthropocentric positions.

VII. DISCUSSION OF THE INTRINSIC VALUE OF NATURE

It is a widely held idea that a "proper" environmental ethics must be based on nature having intrinsic value (as opposed to nature being only of instrumental value to humans), because such value would be a necessary and sufficient ground for human obligations to nonhuman nature.[56] A common line of argument is to establish this necessary connection by way of defending the existence of objective intrinsic values in nature.[57] This argument, however, presupposes that intrinsic values have moral import—and this question is impeded by the many senses of *intrinsic value*. In other words, a key problem with the language of values and intrinsic values is that it tends to confuse questions of value and ethics. In this paper, we have treated the moral considerability of nature without reference to intrinsic value. From this basis the question of the moral import of intrinsic value in its different senses can be addressed and the implications for value theory drawn out.

The systemic ethic takes a relational view of values in line with the relational ontology that is entailed in a systemic conception of nature. According to H. Richard Niebuhr a relational value theory "is objective in the sense that value relations are understood to be independent of the feelings of an observer but not in the sense that value is itself an objective kind of reality."[58] Niebuhr shows how relational value-thinking can be found implicit in both objectivist and subjectivist positions, and how the dichotomy thus masks a common relationary ground. Relational value theory is relativistic (in the sense known from physics), or contextual, and therefore incompatible with the idea of an ideal observer, but not with the idea of objective methods of research with due attendance to the viewpoint of the observer and to the interplay of facts and values.[59] On this basis, a certain structure can be impressed on the concepts of intrinsic value as indicated in the brief discussion below.

John O'Neill distinguishes between three different basic senses of intrinsic value: intrinsic value$_1$ meaning noninstrumental value, intrinsic value$_2$ meaning the value of an object in virtue of its non-relational properties (as employed by G. E. Moore), and intrinsic value$_3$ meaning "objective value," which an object possesses independently of the valuations of valuers.[60] Tom Regan

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[56] E.g., Jim Cheney, "Intrinsic Value in Environmental Ethics: Beyond Subjectivism and Objectivism," *The Monist* 75, no. 2 (1992): 227–36; John O'Neill, "The Varieties of Intrinsic Value," *The Monist* 75, no. 2 (1992): 119–37. See also the recent discussion in Ben A. Minteer, "Intrinsic Value for Pragmatists?," *Environmental Ethics* 23 (2001): 57–75. Note the connection between this formulation of the intrinsic value of nature and the naturalist view of nature.

[57] E.g., Attfield, *Value, Obligation and Meta-ethics*, pp. 29.

[58] H. Richard Niebuhr, "The Center of Value," in H. Richard Niebuhr, *Radical Monotheism and Western Culture* (New York: Harper and Row, 1960), p. 102.

[59] See H. F. Alrøe and E. S. Kristensen, "Towards a Systemic Research Methodology in Agriculture: Rethinking the Role of Values in Science," *Agriculture and Human Values* 19, no. 1 (2002): 3-23, for a detailed discussion of objectivity, contextuality and values in science.

[60] O'Neill, "The Varieties," pp. 119–20.

gives a different threefold distinction in which intrinsic value is understood as either a mental state, a state of affairs, or an end in itself.[61] O'Neill's intrinsic value$_1$ conflates Regan's end in itself and mental state—there are two kinds of opposites to instrumental value: intrinsic value (Reagan's end in itself) and immediate value. Immediate value includes Regan's mental state (experiential value) as well as, for example, physiological value, and it is in opposition to mediate or instrumental values, such as contributive (part), productive (tool) and substitutive (exchange, market) values. Regan's state-of-affairs corresponds to O'Neill's intrinsic value$_2$, but value in this non-relational sense has no place in a relational view of values. O'Neill's intrinsic value$_3$, objective values, must either pertain to a value relation, in which case the term intrinsic value seems inappropriate (because the "objectivity" of a value relation does not in itself imply moral import), or to a non-relational value, in which case it must be discarded here together with intrinsic value$_2$.

Of the senses treated above, only the intrinsic value of an individual being as an end in itself has direct moral import, given that it corresponds to individualistic moral considerability. When using the language of values in ethics, we need to distinguish between moral values, or second order values, such as the intrinsic value of a person, and first order values, such as the experiential and instrumental values that the person "has." It is not values as such that are considerable in ethics, but the other individual or the larger community.[62] The importance of this distinction only becomes evident when the limits of knowledge are taken into account. When there is limited knowledge of the values that some moral object "has," the moral considerability for that object implies a cautious and conservative attitude towards encroaching on the object.

Analogous to the individualistic intrinsic values of individual beings, we can speak of a systemic intrinsic value, corresponding to systemic moral considerability, which designates the moral value of the larger system that the moral agent is a part of. Moreover, this systemic aspect transfers to the consideration for other individuals, whether they themselves are moral agents or not, so that every individualistic intrinsic value is connected with a systemic intrinsic value.[63] The moral value of the other entails the moral value of the larger system that the other is a part of. The systemic values connected to the perspec-

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[61] Tom Regan, "Does Environmental Ethics Rest on a Mistake?," *The Monist* 75, no. 2 (1992): 161–82. Regan uses the term end-in-itself in a Kantian sense. Kant restricted intrinsic value to persons, he contrasted the inner worth (innern Werth) or dignity (Würde) of human individuals with relative values such as market value and sentimental value, see *Fundamental principles*, second section. But Regan describes (pp. 171) how intrinsic value in Kant's sense can be extended to "subjects of a life" that have an experiential welfare or, with reference to Paul Taylor, to "individual living beings" that are "teleological centers of life." Regan uses the term *inherent value,* while Paul Taylor uses *inherent worth.*

[62] Contrary to Attfield, *Value, Obligation and Meta-Ethics*, pp. 36, 38.

[63] See also Judith N. Scoville, "Value Theory and Ecology in Environmental Ethics: A Comparison of Rolston and Niebuhr," *Environmental Ethics* 17 (1995): 115–33; p. 122, for a discussion, based on a relationary view of values, of Holmes Rolston's use of systemic value.

tives of different individuals in the same ecological community are—to some degree—different aspects of a common systemic intrinsic value. We may therefore speak more loosely of the intrinsic value (meaning: moral considerability) of nature or natural processes when there is little need or possibility for distinguishing between the individual and systemic aspects of intrinsic value.

VIII. PRELIMINARY REMARKS ON THE FURTHER IMPLICATIONS OF A SYSTEMIC ETHIC

The systemic ethic enables us to understand and analyze sustainability and precaution as moral concepts on equal terms with the traditional moral concepts of humanist, individualistic ethics. It provides a tool for structuring and criticizing the different meanings of new normative concepts of environmental concern. And it provides those new norms that are in agreement with the systemic ethic, with a stronger moral basis that can give them more credence and influence. In particular, the systemic ethic points to reflexive precaution and functional integrity as more general understandings of precaution and sustainability that include rational precaution and resource sufficiency as means of dealing with known consequences and impacts.[64] Furthermore, the systemic ethic provides options for analyzing and criticizing traditional ethical concepts from a new perspective. For example, by way of including the unknown consequences of human action as important moral grounds of action, the systemic ethic directs attention to our means of knowing consequences and impacts, as well as to the influence of context on knowledge. In this way, the systemic ethic provides a basis for criticizing rationalistic moral theories. And bringing together systemic (or communitarian) ethics and individualistic ethics in a common framework presents a different basis for discussion than that of opposing theories.

In view of the systemic ethic, the concern for our future self and future generations can be seen as an aspect of systemic moral considerability, which is quite different from the individualistic approach to sustainability that is hampered with theoretical problems.[65] In the systemic perspective, the question of "our future selves" involves an extension of the self as an object—an extension of "me." Our concern for the future of our children can be seen as a concern for a slightly wider conception of "me." This perspective provides reason for a further concern for future generations—or future socioecological systems—on grounds of it being in this sense our own future: the ecological community of our grandchildren will be a descendant of the societies and ecosystems of today.

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[64] The view of sustainability and precaution supported by the systemic ethic seems to be largely in agreement with the way these concepts are used in the organic movement.

[65] See Derek Parfit, *Reasons and Persons* (Oxford: Clarendon Press, 1984).