ENVIRONMENTAL and SOCIAL PERFORMANCE

by

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Everything Flows. Heraclitus.
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1 CARE FOR NATURE

A common starting point of environmental ethics is a concern about environmental problems. One might term this awareness care for nature.[1] Espousals of such care range from non-verbal to verbal, from informal oral avowals to formal written statements, whether by individuals or organizations, and a commitment to do something about the environment. But if we are to protect and restore local and global ecosystems care and commitment are, in my view, not enough. *If an organization cares for the environment, I contend, it will act so as not to harm it, and when it cannot so act at the time it will commit itself to such action.* Environmental good will, that is, is only the first step which environmental ethics requires, and commitment is the second; but commitment needs to be distinguished from seemingly similar notions (section 2). Finally performance is what environmental ethics is about, the crowning aim of care and commitment. Clearly we need a model of what good environmental performance involves (section 3). "Doing the right thing," *pace Socrates,* is more important than talking about it.[2]This essay is written in aid of clarifying what doing the right thing environmentally involves. The stress on performance reflects the move from social responsibility and responsiveness to social performance in the business ethics / social issues management fields. Corporate social performance measures, while helpful, are inadequate for assessing environmental performance (see 2). Performance moreover is a complex term, ambiguous, socially constructed and open to interpretation.[3] Accordingly the main concern of this essay is to clarify the nature of environmental performance and the complex means of evaluating it. That is important not only for assessing both organizational commitments to such performances with the help of environmental measures (section 2), but also for envisioning a good, sustainable level of environmental performance (section 3).

Expressions of care for nature are in themselves ambiguous and unreliable, like much talk of ethics in organizations. The espousal of high environmental motives is no guarantee that the needed ecologically beneficent performance will result, speak less of the best achievable performance level. The depth and strength of one's care is not self-evident merely in being stated; it must be proven. An espousal of environmental good will is not in itself an index of ecological benefit. Rather it is merely an expression of an intent or attitude. Such espousals are uncertain indicators of the importance given to environmental concerns. In opinion polling for example for over five years environmental values have enjoyed a high priority with the Canadian public, second only to economic issues.[4] However that high issue ranking has declined due to the recession. While environmental good will might lead to ecological beneficence, or actions that reduce pollution and restore ecosystems, such attitudes are ambiguous and unreliable. Indeed, expressions of care often function as balm for one's guilt or substitutes for action. General espousals of care for nature, even when printed in organizational mission statements, can represent questions about performance more than answers. Good will denotes a motive or intent, but good intentions are notorious for being signposts along the road to the wrong place. Care then is not enough. "Moral articulacy",[5]I contend, is secondary to ethical performance. One must go beyond environmental good will. At the very lest a reliable commitment to performance is required. It is time to clarify what that involves.

2 ENVIRONMENTAL COMMITMENTS & ACTION PLANS

For espousals of care for nature to be credible they must result in the performance of the appropriate ecologically beneficial practices; but since action is often not immediately possible, commitments to appropriate action should at least be pledged. Commitment to performing ecologically beneficial practices represents the flowering of care. Performance commitments mediate care and action. Commitment is necessary in part because the move from care to action is neither immediate nor simple, especially in large organizations. If such commitments are to be credible however reliable and credible measures of environmental performance must be used. These differ from corporate social responsibility and responsiveness measures, as will shortly be indicated.

Organizations often make commitments to improve their environmental track record, e.g., to reduce pollutants and rehabilitate affected ecosystems, etc. Such commitments need to specify performance targets regarding pollution abatement, impact reduction, or site rehabilitation, all within an acceptable timeframe. To test such commitments and see whether the stated targets are met one needs to measure pollution abatement, ecosystem impacts and rehabilitation. One therefore needs appropriate environmental performance measures (EPMs). This would enable environmentalists and other publics to hold organizations accountable to their commitments. If possible, all players, public and private, should use the same set of EPMs. They should facilitate public debate about the reliability of environmental commitments by organizations and of their espousals of environmental care. An important consideration however, is that environmental ethics, unlike other areas of business ethics, must distinguish *environmental* performance measures from social, economic and technological indicators. Environmental ethics stresses the former much more than the latter. Accordingly one needs to identify the environmental performance measures required. Underlying the tumult of environmental debate, I would suggest, one can discern four key types of environmental performance measures, of: pollutant load and concentration levels, ecosystem impacts, and ecosystem rehabilitation. Other, more indirect measures crop up frequently in environmental debates: concerns about an organization's social/environmental responsibility or responsiveness, about economic and technological matters.[6] Accordingly I would suggest the following set of four Direct and three Indirect Environmental Performance Measures:

<u>DIRECT EPMS</u>

L Pollutant LOAD LEVELS; e.g., emissions of carbon, sulphur or nitrogen oxides, e.g., in kilotons / year [kt/y].

C Pollutant CONCENTRATION levels: e.g., organochlorine compounds [or AOX] In kilograms per ton [kg/t] of water.

I Ecosystem IMPACT / effect levels of pollutants: e.g., on species numbers and health: measures of lethality to fish, deforestation, species extinction, diseases, etc.

R Ecosystem REHABILITATION measures, e.g., increases in species numbers, diversity in a habitat, and/or improvements in their health and functioning, e.g., as a percent of some baseline.

INDIRECT EPMS

T TECHNOLOGICAL: indicators of the 'environmental friendliness' of a product or process design, materials, etc, and techniques like 3R design, energy efficiency, etc.

E ECONOMIC trend indicators like returns, production outputs, etc., usually combined with L, C, R or I.

O ORGANIZATIONAL. Social responsiveness indicators along a spectrum from reactive to proactive (see Figure 1).

Direct EPMs are central themes in discussions of pollution abatement, ozone depletion and biodiversity. The stress may be on reducing pollutant loads or concentrations (C and L), on decreasing harmful impacts (I), or on rehabilitating an ecosystem (R measures), usually in terms of plant, insect and animal population levels. Pollutants may be measured in C terms for organochlorine compounds and dioxins or L EPMs for CFCs, SOx, COx and NOx emissions, etc. The reliability of concentration measures is controversial, for dilution can keep C constant despite pollutant load increases (L). Nonetheless it is the dosage, or C, which usually causes damage to ecosystems. Ecosystem Impact measures, I, are preferable to either C or L, because they reflect the damaging effects of the contaminants at issue, and it is such effects that are the major concern in environmental ethics. Since ecosystem damage is commonly the problem at issue, ecosystem rehabilitation (R) is the appropriate solution. R measures may indicate the extent of reclamation of a mine site, reforestation of a logging cut, or return of fish to a once acidified lake. I and R measures are closely linked. Both I and R measures compare pollutant effects on ecosystems, e.g., above / below a discharge point or before / after a plant was built. While R is implicit in I, separating it out clarifies the range of the EPM model, notably the importance of going beyond pollution abatement measures. R is of special importance where the environmental concern is the habitat destruction and resource depletion so common in North American resource industries. L, C, I and R levels all vary with contaminants, technologies, and sites. All four EPMs are essential to specifying target levels in action plans, thereby facilitating the accountability of organizations to their environmental commitments. However since ecologically beneficent performance is the main the object of care for nature, and of environmental commitment, ecologically beneficence is the guiding norm in using direct EPMs. C and L only measure the amount of potential pollutants being introduced into an ecosystem. They do not indicate the actual harmful (or beneficial) effects of such substances on that ecosystem. I in contrast directly indicates harmful ecosystem effects, and therefore has a priority over L and C. Furthermore R, as a measure of ecosystem rehabilitation and recovery, reflects ecosystem benefit and health. R is the key measure. In consequence the first grounds rule of the environment performance ethic is that R and I measures are preferred over C and L measures. In effect ecosystem health, ecosystem impacts and rehabilitation, count more ethically than do measures of the amount of contaminants in an ecosystem.

In contrast O, E and T are only indirect measures, from an environmental standpoint. The place and nature of economic measures (E), is problematic even in business ethics, a point touched on in the last section. While helpful, technology measures (T) do not directly reflect ecological beneficence. Technology choice also involves economic and technical criteria, so T is an indirect EPM. O measures are typically used to position organizational social issue performance along a spectrum from *Reactive* to *Proactive*.[7] Four social issue stances are commonly articulated (see Figure 1), from reactive postures like *Resistance* or mere *Compliance*, to *Accommodating* others' concerns and *Leading* the industry track record. as one moves from left to right along the spectrum.

The SOCIAL PERFORMANCE SPECTRUM			
⇐ Reactive/ Unresponsive		Responsive/ Proactive ⇒	
Resistant	Compliant	Accommodative	Leading

Positioning an organization on the Social Performance Spectrum rests on indirect O type indices of corporate social responsiveness: organizational statements, policies and codes, questionnaire responses, and espousal reports, as much as direct performance measures, e.g., regarding employment equity, product and workplace health and safety, etc. These are customarily based on the survey techniques common in management research or the textual interpretive studies of business ethicists.[8] The social performance spectrum should however seek to ascertain performance rather than organizational espousals of care, attitudes or commitments.[9] Social performance positioning should rest on indicators of performance or at least solid commitments to action. Even then however environmental concerns would be bundled in with the other social issues covered by O measures. The four environmental performance measures still differ from the three social performance indicators in key respects.

Having said all this, *Resistant* firms, at the extreme left of the spectrum, are those which evade or stonewall a social issue. An improved but still reactive position is that of legal *Compliance* to regulatory requirements. Reactive stances usually reflect short term profit-maximizing approaches. Such organizations see environmental and social values as conflicting with economic values like competitiveness and profit.[10] Indeed the view that profit (an E measure), is incompatible with social performance (O measures), is unfortunately held by many ethicists, environmentalists and businesspeople.[11] The environmental posture of the Canadian pulp and paper industry has for example been characterized by one commentator as "short term myopia."[12] This is evidenced in the lack of secondary (and sometimes even primary) effluent discharge treatment facilities at many mills, widespread industry resistance to regulations requiring the virtual elimination of organochlorines (L), and in the unresponsiveness of many firms to the growing market demand for green paper products. *Accommodative* organizations in contrast are willing to discuss and negotiate social issues with stakeholders and governments, and to commit themselves to action, often ahead of government regulations. *Leading* organizations surpass their sector in their social performance commitments and track records. Quantitative tracking of social performance is possible in spheres like employment equity, health and safety, and income distribution as well as for environmental issues. Without some such indicators spectrum positioning is difficult. Environmentally responsive organizations would proactively anticipate governmental policies for pollutant reductions and impact improvements

(C, L, I), approach zero discharge and impact levels (C, L, I), and voluntarily move on site rehabilitation (R). The Howe Sound, B.C. pulp and paper mill for example is the first in Canada to use no organochlorines (or AOX); and AOX levels are below 1 kg/ton of water at the Espanola, Ontario mill of the E. B. Eddy paper company. Some paper companies are in addition moving into the growing recycled paper market.[13] Mining companies like Falconbridge have often been ahead of Ontario government regulatory requirements re SO2 emission and tailings discharges and are voluntarily rehabilitating some old mine sites.[14] Given that this often requires R&D and has some economic benefits, E and T measures reinforce O measures for such firms. However since social performance measures can not measure the state of ecosystems, even indirectly, the four direct environmental performance measures must be used if one is to evaluate an organization's environmental performance. The second ground rule of an environmental performance ethic then is the normative preference for Direct EPMs over Indirect. When linked with the first ground rule, the normative preference for R and I direct EPMs over L and C, we have two key principles of an environmental performance ethic.

In contrast to utopian moral theory the interaction of economic, technological and social concerns with environmental values suggests that care, commitment and motives need not be single or pure. Organizations, like people, rarely act from a single motive. Rather environmental commitments in business are commonly undertaken for several reasons: to improve a firm’s profitability, competitiveness, markets, image, regulatory compliance, as well as to solve environmental problems, reclaim ecosystems, etc. Mixed motives are an acceptable basis for commitment, as long as they lead to ecologically beneficent performances.[15] Moreover as an organization's performance track record becomes evident over time its motivation is more discernible. This is important; for to the extent that economic and technological improvements (E and T) are congruent with environmental commitments there is greater hope that organizations will improve their environmental performance.

While environmental commitments do involve obligations, and C, L and I EPMs are akin to environmental 'welfare' measures, inasmuch as harm to natural habitats should to be reduced, no meta-ethical theory is thereby entailed, whether deontology or utilitarianism.[16]Rather, care for nature is, in my view is justified by the specifically environmental norm that nature of itself has moral value.[17] Organizational commitments are like promises in being time pledges, viz of conduct in the future; but this does not imply that morality is reduced to promises. That is too individualistic and anthropocentric a view. Instead this essay reflects environmental ethics' move away from modern moral theory's focus on the private mental realm to the more public realm of social actions and their effects on natural habitats. Personal commitments to environmental values remain important to the extent that an individual's values affect organizational values. However, unlike personal promises organizational commitments are expressed in written, official policy statements. To get organizations to make such formal commitments environmentally committed individuals must occupy authoritative or influential roles in organizations.

If an organization's commitment to environmental care and responsibility is to be credible, it must specify how it will act in regard to its environmental problems. Since the commitments are future oriented a time frame in which one would live up to one’s commitment needs to be stated. Commitments then should specify performance targets and timetables.

Without such action plans informal pledges and even formal organizational environmental policies and codes mean little. Action plans therefore require the use of EPMs to define targets (outcome goals), e.g, re the proposed levels of decrease in AOX concentrations (C) from pulp and paper mill discharges or SOx loads (L) in emissions from mine smelters, fish population rises near mills (I), or reforestation of logging cuts (R). Such action plans, along with past track records, are more reliable indicators of an organization's commitment to ecological beneficence than are espousals of care, responsibility or promises. In reality moreover many firms do develop detailed action plans. To the extent that such plans are documented and publicized they facilitate the organization's accountability.

Agreement on acceptable time frames is a critical matter, for commitments are temporal in nature. Deciding acceptability cannot be separated from performance target levels, for they are interlinked. While environmentalists and business people both favour results and outcomes, they usually differ re target levels and timeframes. The greater the regional / territorial load or concentration of a pollutant or the more toxic its effects, the greater the social pressure on polluter organizations to reduce L or C levels rapidly. For instance when lower more stringent C, L or I target measures, or higher R levels, are demanded, organizations may seek longer time frames in which to achieve them. If however targets are too vague, C, L or I targets are too high, R levels too low, or the time horizon too far in the future, an organization's environmental commitments may not be publicly credible. Too little appears to be promised too late.

The need for specific commitments may make action plans seem like contracts; but this too is misleading. Environmental performance commitments are frequently enforced on businesses by public pressure or government regulation. Therefore they are not always voluntary, as contracts must be. In addition the consent of a contracting party does not constitute the ethical substance of environmental commitments. Rather that resides in the ecosystem benefit yielded by one's actions, viz, in ecological beneficence. Nor can the beneficiaries of these commitments, future generations or the affected ecosystems, be parties to such contracts. Nature is not a social interest group or a stakeholder. So to anthropomorphize nature is unacceptable in environmental ethics.

In review then commitment is ethically important inasmuch as it mediates care and performance, environmental benevolence and ecological beneficence; but neither care nor commitment suffice in bringing environmental concerns to bear in business ethics, and the social performance approach is too indirect for environmental problems. Instead what is required of organizations is to perform, within an acceptable timeframe, the ecologically beneficial practices demanded by the ecosystem problem at hand. Ecologically beneficent performance matters more than environmental care or commitment. Having said this however the appropriate relationship of direct and indirect environmental performance measures is not apparent; nor is the concept of the best achievable environmental performance level. To these topics I will now turn.

A GOOD ENVIRONMENTAL PERFORMANCE PATTERN

The aim of this section is, as promised, to present a model of good environmental performance. It should be ecologically beneficent rather than harmful and therefore be sustainable within an ecosystem over a significant time period. This approach is realistic and practical in contrast to impossibilist utopian ideals. It represents an ethic of the good, of satisficing rather than maximizing. In order to do this not only must reflect the demand to sustain ecosystems, it should also reinforce appropriate social performance. In effect environmentally sound performances should integrate direct, ecologically beneficent, performances and indirect, socially beneficent, performances. Thus direct and indirect EPMs should track mutually reinforcing paths. This exemplar is the pattern depicted in Figure 2.

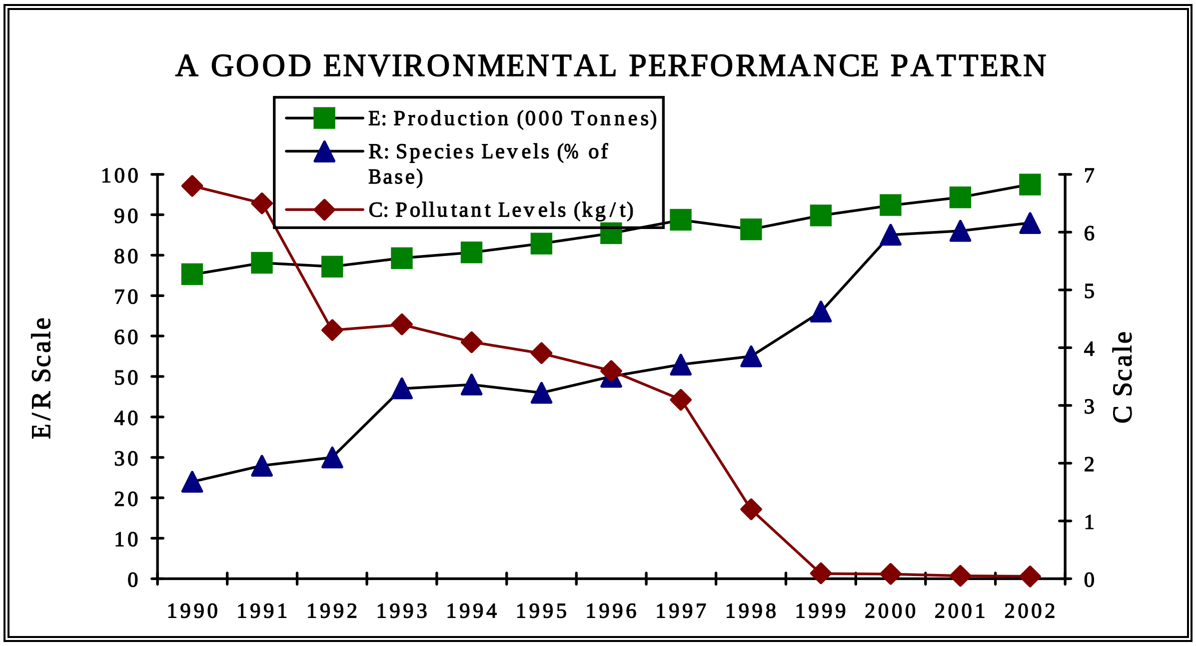

Figure 2

The production trendline exemplifies the common habit of correlating indirect economic (E) measures with direct EPMs, such as L and R. Other indirect EPMs like economic returns, technologies and organizational policies might also be presented. All however represent indirect EPMs (E, T, and O respectively). While the social performance of a business is defined in indirect terms through the *Social Performance Spectrum* (O), with the help sometimes of E and T measures, determining environmental performance requires one to interpret the character and results of conduct in directly environmental L, C, R and I terms. Direct EPMs are called for, rather than Indirect EPMs, as stated in the second environmental performance ethic ground rule. In fact documents reporting on environmental problems commonly present one with charts using direct EPMs.[18]

Figure 2 embodies a good sustainable development pattern. It depicts a correlation between a production trend (an indirect E measure) and the two environmental trends presented with the help of direct EPMs: pollutant reduction (C) and site rehabilitation(R). It shows pollution reduction and ecosystem rehabilitation being reinforced by a stable or gently rising production trendline over a long time period. This is a good pattern because it shows a positive correlation between pollution reduction / ecosystem rehabilitation and production. This exemplifies the second environmental performance ethic ground rule, the normative preference for ecosystem rehabilitation, and impact reduction (I), over pollution abatement (L and C). Economic and environmental benefits are linked. This suggests that environmental performance is positively reinforced by economic benefits. Environmental improvements are also reinforced by technological improvements; for both are commonly required to achieve the combination of production increases and ecosystem rehabilitation presented in Figure 2. It represents a picture of good, ethically sound environmental performance in which social (i.e., economic and technological) and ecological benefits are in phase, and, indeed mutually reinforcing.

The timeframe is over a decade so as to stress the long term time horizon typical of environmental performance. Over that period one may even expect a satisfactory return, or level of profitability for the firm. This pattern is not, note, the same as a short term profit maximizing pattern. Short term high returns furthermore often collapse into losses,[19] displaying the classic boom/bust cycle of the resource industry. In contrast in Figure 2 after C levels dip (1989 and 1995-96) R levels might rise (1990, 1997-98); but we also see plateaus in which the pace of change is more gradual. The promise of socio-ecological sustainability resides precisely in the mutual reinforcement of environmental and economic goods over a significantly long time period, such as the convergence of positive E and R trends over 12 years. It is further reinforced by the accompanying divergent trendline, representing declining pollutant levels (in C terms). The C measures could for instance refer to AOX (organochlorine compounds) reductions in pulp and paper mill discharges, R to the recovery of nearby waters as indicated by their approximation to pre-mill baseline conditions, while E measures could refer to paper or pulp production increases. The call of many environmentalists for instance for C and L to reach virtual elimination / zero levels or for persistent, bioaccumulative contaminants is reflected in the C trendline from 1997 forward.[20] Alternatively, L measures like $SO2$ emission reduction trends could be represented, and correlated with mine smelter production trends. Zero or near zero discharge is therefore only important to the extent it contributes to reducing impacts and aiding ecosystem recovery. Ecosystem rehabilitation is the key aim and the primary goal, as the first ground rule holds.

In Figure 2 production is represented as relatively stable rather than growing fast in acknowledgement of the 'steady state' approach of environmental economics.[21] Other economic trends like improved profits or sales can also reinforce environmental performance, such as the growing market demand for green products.[22]This is an ethically good pattern because it shows economic and environmental performance improvements reinforcing each other. Such convergence represents a typical sustainable development pattern. Technological measures too can, should and do reinforce environmental performance, especially as organizations move away from old industrial technologies and towards environmentally friendlier systems, such as sustainable forestry, cleaner pulp and paper mills and mine smelters. Environmentally clean technologies are as much part of the solution to environmental problems as are stable economic returns. T measures may also be reflected in an organization's acquisition / development of ecologically friendlier technologies, e.g., those using 3 R design principles.

Given the growing critique of the effectiveness and costs of command and control regulatory approaches, the convergence of environmental with other measures suggests a better approach to environmental policy, especially where the parties are willing to act and where economic returns and technological innovations are likely because of the improved environmental performance. The convergence of organizational, economic, and technological measures with environmental values is a promising basis for sustainable long term environmental performance.[23]Such problems can be intercontinental in scope, especially when the pollutant emissions are great in volume and range widely across national boundaries, as shown in North American and European problems with acid rain, and the need to reduce SO2 emissions from a relatively few large emission sources, like smelters and oil-fired electrical utilities. More global problems, like the greenhouse effect, may be less malleable to this specific problem solving approach, but direct EPMs would still retain a crucial indicator function. Figure 2 suggests that ecological beneficence is ordinarily directed to solving a defined problem in a specific local or regional ecosystem, viz, of load / concentration abatement of a specific pollutant, reducing harmful impacts and or aiding habitat rehabilitation.

Ecologically beneficent performances then include both environmental practices and their ecosystem outcomes, as indicated with the help of the direct EPMs, L, C, I and R. EPM based performance evaluation retrospectively discloses the strength and resolve of prior espousals of care for nature and pledges of environmental commitment. Direct EPMs also help control the ambiguities of social performance measures and reinforce the primacy of environmental values in evaluating performance. They thereby facilitate evaluation the extent to which organizational practices are ecologically harmful or beneficial. They tell us when we are 'doing the right thing' for the environment, and, to the extent that we are not, suggest how we might correct our performance. One needs therefore to determine one's performance in reducing pollutants or ecosystem impacts or restoring an ecosystem.

The observable and testable character of direct EPMs satisfies a central demand of environmental ethics, namely for a substantive, "non-vacuous" model of good performance.[24]Indeed in contrast to the social performance field scientific and technical knowledges have a central role to play in resolving environmental issues. The scientific and technical aspects of ecologically beneficent practices,[25] are evident in the four direct EPMs: L, C, I and R. One cannot determine the nature and extent of the environmental impacts of old industrial technologies without assuming the cognitive validity of the chemistry and biological sciences and related technologies that direct EPMs assume. EPMs are moreover explicitly designed to facilitate the ecological evaluation and restoration of habitats. Here in the environmental field determining the extent of an ethical harm requires use of L, C and I measures, which involve relevant sciences and technologies. Often only by using such direct environmental performance measures can one accurately discover and report the extent of ecological harms, or, for that matter, determine the actual extent of an ethical good like ecosystem recovery (R), which is the main normative preference of an environmental performance ethic, as implied in the first ground rule. And determining the actual extent of ecological harms and benefits is essential to making sound ethical judgements about many environmental matters. Indeed making an ethical judgement about the success of one's environmentally benevolent intentions, commitments, and related actions (or action plans), is often impossible without using direct EPMs. The present stress on direct EPMs does not therefore imply a positivist, brute fact or value-free model of science or technology. Rather it suggests what Donald Schon terms ethically reflective "action sciences."[26]

Indeed environmental ethics has been associated with the ecological and life sciences and related scientific, and technical knowledges that developed in the last century: chemistry, biology, ecology, informatics, and engineering.[27] These environmental `action sciences' are confirmed in the countless everyday practical use of science-based technologies, just as the damaging impact of industrial and chemical technologies on ecosystems has been extensive. Reference to scientific, direct EPMs is then connotes environmental values like ecosystem dysfunction and health. Rather common sense and scientific technical knowledges are here seen as complementary, as providing different kinds of information, from different cognitive standpoints. Both non-scientific and everyday knowledges contribute to our interpretation of environmental matters and judgements re environmental performance. Harmful ecosystem impacts and restoration to health are each evident in the direct everyday experiences of those living and working in them. Everyday perception reveals both the destruction and recovery of ecosystems, whether of the waters downstream from a pulp and paper mill that has developed environmentally sound processing and treatment systems, or in a mining town where smelter emissions have been drastically reduced. Both ecological damage and habitat recovery may be visible to common sense, and complemented by scientific measurement techniques, as would the discharge of many pollutants. Direct EPMs using appropriate sciences and technologies facilitate the detailed measurement of contaminants, harms and rehabilitation and enable the confirmation of commitments to improve one's environmental performance, whether by pollution abatement, or site rehabilitation. However the detection of the presence of many pollutants (L and C), and their ecosystem impact, and of its recovery (I and R), is often not possible without the use of scientific measures and appropriate measurement technologies. So the perception of environmental harms and benefits requires reference to the four direct EPMs.

In effect good, well constructed scientific and technical knowledges work. Along with everyday experience they tell us what is happening in our habitat. They disclose in fine detail, well beyond the limited capacities of the human sensorium, the extent of ecosystem harm of social and organizational practices and, as well, the degree of habitat rehabilitation. In contrast ill-conceived or inappropriate scientific and technical concepts, dogmatic ideological prejudices, and simplistic common sense impressions are unreliable and often invalid. They tend to yield mistakes and encourage misinterpretation. This is especially the case when they reflect inappropriate, anachronistic knowledges, e.g., a general antipathy to `chemicals', or simplistic, polarized stakeholder views about chlorine use in pulp and paper mills, or SO2 emissions from smelters, or electrical generation plants. Environmental discourse therefore is ethical and social as well as technical; and EPMs are complex socio-technical constructs.

In conclusion it has been shown that an environmental ethic cannot be satisfied merely with the espousal of a general care for nature. Such espousals of ethical concern for the environment ought at least lead to reliable commitments to ecologically beneficent performances, e.g., as specified in appropriate action plans. And commitment itself must result in performance of the appropriate ecologically beneficent practices. Environmental ethics needs to clarify this performance concept. This has been done with the help of the four direct EPMs. Considering them in terms of environmental ethics suggest that practices which reduce harmful impacts to ecosystems and help rehabilitate them are preferable to those which merely decrease pollution. Hence the first ground rule follows, a normative preference for rehabilitation and impact improvements, as measured by R and I EPMs, over pollution abatement practices, as measured by L and C EPMs. To determine what ecologically beneficent performances are indicated in a situation, the second ground rule holds, we need direct environmental measures, such as the four EPMs; for environmental performance is normatively preferred to social, organizational, technological or economic performances. These two maxims show why I speak of an environmental performance ethic.

Direct EPMs take a scientific and technical form which enables environmental performance evaluation to achieve a fine, microscopic detail and broad spatio-temporal reach, beyond the limits of human observation, into past history and into regional and even global ecosystems. That reach is required by the nature of ecosystem problems and ecosystem recovery. In environmental ethics scientific and environmentally ethical knowledges complement each other. Indeed environmental performance ethics involves a complex dynamic of knowledges, social, ethical, and technical. In environmental discourse social and environmental, scientific, technical, and common sense concerns all interact. They do not always agree, but that is to be expected given the complexity of ecosystems and social dynamics involved. Recourse to scientific direct EPMs helps us overcome the environmentally significant limitations of human powers and intelligence. Without scientific measures numerous judgements about the appropriate or desirable environmental action or policy would often be extremely difficult to make, if not at times impossible.[28] One result is not only to integrate economic, technical and social concerns with environmental values, but also to present a model of ethically good environmental performance. That model shows that economics and ecology can be mutually reinforcing, as ecologically sustainable development demands. To that greater goal, the concept of ethical environmental performance developed here is, I hope, contributory.

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ENDNOTES

1 See H. Rolston III. *Environmental Ethics.* Temple. 1988, ch.1, on care for nature. The inadequacy of care is generally true for every sphere of value. The allusion to *sorge* in Heidegger's *Being and Time* is intended. This essay is an exercise in articulating ethics as part of being in the world, natural as well as social. I assume the eco-ontological view that the human species is inseparably a part of Gaia, the terrestrial ecosystem, and the moral implication that we should therefore care for it and stop destroying it (see J. Lovelock, G*aia, A New Look at Life on Earth*. Oxford, 1979). The concern here is however not to probe the depths of environmental ethical theory so much as to examine its practical performance orientation.

2 This phrase is very common in real world, as I and my two colleagues, Barry Cotton and John Dodge, have discovered in interviewing managers in an Ontario resource company, as part of an environmental management case study for the Environmental Values And Technological Innovation research project.

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[3] On the ambiguity and complexity of human action, and therefore, of ethical notions of performance see A. Ryan. *Philosophy of Action*. Oxford, 1968; P. Winch. *The Idea of Social Science*. Routledge, 1958; P. Berger and T. Luckmann. *The Social Construction of Reality. Doubleday*, 1966; R. Bernstein. *Praxis and Action.* Univ. of Pennsylvania, 1971. Some forms of discourse about social, economic, etc., action can distance people from the material realities of damaged ecosystems and their recovery. Indirect EPMs suffer from such limitations, especially socio-economic performance measures, in contrast to direct EPMs.

[4] P. Lush. Canadians favor trees over polls. *Toronto Globe and Mail.* 26 Jan., 1992. P. Gorrie. Poll finds economy outranks environment. *Toronto Star*. 6 Feb., 1992.

[5] See Charles Taylor. *Sources of the Self.* Cambridge Univ. Press, 1991, chs. 3, 4.

[6] These four types of EPM appear frequently in public policy, government regulations, environmental auditing, assessment and management. See the tables in Environment Canada. *State of the Environment Canada,* Supply and Services Canada, 1991, and the OECD report, *State of the Environment*. OECD, 1991.

[7] See S. Wartick and P. Cochrane. The Evolution of The Corporate Social Performance Model. *Academy of Management Review*. 1985, 758-69; D. J. Wood. Corporate Social Performance Revisited. *Academy of Management Review*. 1991, 691-718; Max B.E. Clarkson. Corporate Social Performance in Canada 1976-1986. *Research in Corporate Social Performance and Policy*. JAI, Conn: 1988. Vol. 10, 241-265; Edwin M. Epstein. The Corporate Social Policy Process: Beyond Business Ethics, Corporate Social Responsibility And Responsiveness. *California Management Review*. XXIX: 3; 1987, 99-114. M. B. Meznar, J. J. Chrisman and A.B. Carroll. Social responsibility and Strategic Management: Toward an Enterprise Strategy Classification. *Business and Professional Ethics*. 10:1; 1991, 47-66; C. Mathews. *Strategic Intervention In Organizations*. Sage, 1988, ch. 2.

[8] An interesting, if controversial, critique of the abstractness of the business ethics is found in Andrew Stark. What's the matter with business ethics? *Harvard Business Review.* May June, 1993; 93:3, 38-48. Also see the debate about post-modern ethics in *Business Ethics Quarterly*. 3:3; July 1993.

[9] For a discussion of performance oriented social responsiveness see R. Gatewood and A. Carroll. Assessment of Ethical Performance of organizational members: a Conceptual Framework. *Academy of Management Review.* Oct., 1991; 16:4, 667-90.

[10] See Charles Kelly. *The Destructive Achiever. Power and Ethics in the American Corporation.* Addison Wesley, 1988; David Olive. *Just Rewards*. Key Porter, 1987; Michael Jacobs. *Short Term America.* Harvard Business School Press, 1991.

[11] See T. Schrecker. Risks vs. Rights. In D. Poff and W. Waluchow, eds. *Business Ethics in Canada.* Prentice Hall, 1991, 333-52. For an ecologically driven rethinking of the fundamentals of economics see Herman Daly. *Steady State Economics.* Island, 1990.

[12] Len Brooks. Opportunities Lost: Short term Myopia. *Corporate Ethics Monitor*. 1991; 3:6, p 81.

[13] V. Di Norcia, B. Cotton and J. Dodge. Canada's Paper Industry and Recycling: Losing Competitive Advantage? *Business Strategy And the Environment*. Jan-Feb., 1994, 2-7.

[14] See for example Table 11.4, in *State of the Environment Canada.*.

[15] See V. Di Norcia and Joyce Tigner. Mixed Motives in Business Ethics. Presented at the 1994 meeting of the Society for Business Ethics.

[16] In similar fashion Rolston stresses duties and policies, *op. cit.*, chs. 5 and 8. Also A. MacIntyre, in *After Virtue* (Univ. of Notre Dame, 1981.) and B. Williams. *Ethics and the Limits of Philosophy*. (Harvard UP, 1985) raise doubts about the validity of moral theory. The performance orientation presented here may have some significance for theory building, `from the ground up'.

[17] See Rolston, *op. cit*. ch. 1, and A. Naess, *Ecology, Community and Lifestyle*. Cambridge UP, 1989.

[18] See Ch. 2, Fig. 10, Trends in man-made NOx Emissions, OECD, *State of the Environment*, p 19. Similar emission trend tables are presented for CO2 and SOx as well, on pp, 17, 21.

[19] See V. Di Norcia. Ethics, Technology Development, and Innovation. *Business Ethics Quarterly.* July 1994; Vol. 4, No. 3:. 235-52*.*

[20] P. Muldoon and M. Valiante. *Zero Discharge.* Canadian Environmental Law Association, 1990.

[21] See H. Daly, ch. 2; Rolston, ch. 8; and R. Paehlke. *Environmentalism and the Future of Progressive Politics.* Yale UP, 1989, 124ff.

[22] See R. Welford and A. Gouldson. *Environmental Management And Business Strategy*. Pitman, 1993, ch. 1; P. Carson and J. Moulden. *Green is Gold*. HarperCollins, 1991; W. E. Stead and J. G. Stead. *Management for a Small Planet.* Sage, 1991; and F. Cairncross. *Costing the Earth*. Harvard Business School, 1992,

[23] As sketched out in Daly and Cairncross. Moves towards economic / environmental congruence, as yet barely noticeable, are further evidence of a revolutionary paradigm shift from unlimited growth market economics and industrial system to a limited sustainable development environmental economics.

[24] See J. Thompson. A Refutation of Environmental Ethics. *Environmental Ethics*. Summer 1990, Vol. 12, p. 150.

[25] See Paehlke, ch. 5.

[26] D. Schon. *The Reflective Practitioner* . Harper, 1982, 319f.

[27] See T. Goudge, *The Evolution of Life*, Univ. of Toronto, 1961. B. J. F. Lonergan *Insight*. Longmans, 1958, IV:2, XV:7; and J. Lovelock, *op. cit.*, on the diverse evolutionary, ecological emergentist and developmental system logics in the life sciences.

[28] The `chaos'characteristics of complex systems, notably their tendency to divergence and unpredictability, cannot be handled by linear logic. See James Gleick. *Chaos: Making a New Science*. Penguin, 1988. On the striking adaptiveness of complex systems, which may have interesting implications for an evolutionary / environmental ethics see M. Waldrop. *Complexity.* Simon & Schuster, 1993.