

Deep Ecology - A New Paradigm

This book is about a new scientific understanding of life at all levels of living systems - organisms, social systems, and ecosystems. It is based on a new perception of reality that has profound implications not only for science and philosophy, but also for business, politics, health care, education, and everyday life. It is therefore appropriate to begin with an outline of the broad social and cultural context of the new conception of life.

CRISIS OF PERCEPTION

As the century draws to a close, environmental concerns have become of paramount importance. We are faced with a whole series of global problems which are harming the biosphere and human life in alarming ways that may soon become irreversible. We have ample documentation about the extent and significance of these problems.¹

1 One of the best sources is the series of annual reports, *State of the World*, published by the WorldWatch Institute in Washington, DC. Other excellent accounts can be found in Hawken (1993) and Gore (1992).

The more we study the major problems of our time, the more we come to realize that they cannot be understood in isolation. They are systemic problems, which means that they are interconnected and interdependent. For example, stabilizing world population will only be possible when poverty is reduced worldwide. The extinction of animal and plant species on a massive scale will continue as long as the Southern Hemisphere is burdened by massive debts. Scarcities of resources and environmental degradation combine with rapidly-expanding populations to lead to the breakdown of local communities, and to the ethnic and tribal violence that has become the main characteristic of the post-Cold-War era.

Ultimately, these problems must be seen as just different facets of one single crisis, which is largely a crisis of perception. It derives from the fact that most of us, and especially our large social institutions, subscribe to the concepts of an outdated worldview, a perception of reality inadequate for dealing with our overpopulated, globally interconnected world.

There *are* solutions to the major problems of our time; some of them even simple. But they require a radical shift in our perceptions, our thinking, and our values. And, indeed, we are now at the beginning of such a fundamental change of worldview in science and society, a change of paradigms as radical as the Copernican Revolution. But this realization has not yet dawned on most of our political leaders. The recognition that a profound change of perception and thinking is needed if we are to survive has not yet reached most of our corporate leaders either, nor the administrators and professors of our large universities.

Not only do our leaders fail to see how different problems are interrelated; they also refuse to recognize how their so-called solutions affect future generations. From the systemic point of view, the only viable solutions are those that are 'sustainable'. The concept of sustainability has become a key concept in the ecology movement and is indeed crucial. Lester Brown of the Worldwatch Institute has given a simple, clear and beautiful definition: 'A sustainable society is one that satisfies its needs without diminishing the prospects of future generations.'² This, in a nutshell, is the great challenge of our time: to create sustainable communities, i.e. social and cultural environments in which we can satisfy our needs and aspirations without diminishing the chances of future generations.

2 Brown (1981).

THE PARADIGM SHIFT

My main interest in my life as a physicist has been in the dramatic change of concepts and ideas that occurred in physics during the first three decades of the century, and which is still being elaborated in our current theories of matter. The new concepts in physics have brought about a profound change in our worldview; from the mechanistic worldview of Descartes and Newton to a holistic, ecological view.

The new view of reality was by no means easy to accept for physicists at the beginning of the century. The exploration of the atomic and subatomic world brought them in contact with a strange and unexpected reality. In their struggle to grasp this new reality, scientists became painfully aware that their basic concepts, their language, and their whole way of thinking were inadequate to describe atomic phenomena. Their problems were not merely intellectual but amounted to an intense emotional and, one could say, even existential crisis. It took them a long time to overcome this crisis, but in the end they were rewarded with deep insights into the nature of matter and its relation to the human mind.³

The dramatic changes of thinking that happened in physics at the beginning of this century have been widely discussed by physicists and philosophers for more than fifty years. They led Thomas Kuhn to the notion of a scientific 'paradigm', defined as 'a constellation of achievements - concepts, values, techniques, etc. - shared by a scientific community and used by that community to define legitimate problems and solutions.'⁴ Changes of paradigms, according to Kuhn, occur in discontinuous, revolutionary breaks called 'paradigm shifts'.

Today, twenty-five years after Kuhn's analysis, we recognize the paradigm shift in physics as an integral part of a much larger cultural transformation. The intellectual crisis of the quantum physicists in the 1920s is mirrored today by a similar but much broader cultural crisis. Accordingly, what we are seeing is a shift of paradigms not only within science but also in the larger social arena.⁵ To analyse that cultural transformation I have generalized Kuhn's definition of a scientific paradigm to that of a social paradigm, which I define as 'a constellation

³ See Capra (1975).

⁴ Kuhn (1962).

⁵ See Capra (1982).

of concepts, values, perceptions, and practices shared by a community, which forms a particular vision of reality that is the basis of the way the community organizes itself.'⁶

The paradigm that is now receding has dominated our culture for several hundred years, during which it has shaped our modern Western society and has significantly influenced the rest of the world. This paradigm consists of a number of entrenched ideas and values, among them the view of the universe as a mechanical system composed of elementary building-blocks, the view of the human body as a machine, the view of life in society as a competitive struggle for existence, the belief in unlimited material progress to be achieved through economic and technological growth, and - last, not least - the belief that a society in which the female is everywhere subsumed under the male is one that follows a basic law of nature. All of these assumptions have been fatefully challenged by recent events. And, indeed, a radical revision of them is now occurring.

DEEP ECOLOGY

The new paradigm may be called a holistic worldview, seeing the world as an integrated whole rather than a dissociated collection of parts. It may also be called an ecological view, if the term 'ecological' is used in a much broader and deeper sense than usual. Deep ecological awareness recognizes the fundamental interdependence of all phenomena and the fact that, as individuals and societies, we are all embedded in (and ultimately dependent on) the cyclical processes of nature.

The two terms, 'holistic' and 'ecological', differ slightly in their meanings, and it seems that 'holistic' is somewhat less appropriate to describe the new paradigm. A holistic view of, say, a bicycle, means to see the bicycle as a functional whole and to understand the interdependence of its parts accordingly. An ecological view of the bicycle includes that, but it adds to it the perception of how the bicycle is embedded in its natural and social environment - where the raw materials that went into it came from, how it was manufactured, how its use affects the natural environment and the community by which

6 Capra (1986).

Eventually, we will not need to throw everything away, but before we know that, we need to be willing to question everything. So, deep ecology asks profound questions about the very foundations of our modern, scientific, industrial, growth-oriented, materialistic worldview and way of life. It questions this entire paradigm from an ecological perspective: from the perspective of our relationships to one another, to future generations, and to the web of life of which we are part.

SOCIAL ECOLOGY AND ECOFEMINISM

In addition to deep ecology, there are two other important philosophical schools of ecology, social ecology and feminist ecology, or 'eco-feminism'. In recent years there has been a lively debate in philosophical journals about the relative merits of deep ecology, social ecology, and ecofeminism.¹⁰ It seems to me that each of the three schools addresses important aspects of the ecological paradigm and, rather than competing with each other, their proponents should try to integrate their approaches into a coherent ecological vision.

Deep ecological awareness seems to provide the ideal philosophical and spiritual basis for an ecological lifestyle and for environmental activism. However, it does not tell us much about the cultural characteristics and patterns of social organization that have brought about the current ecological crisis. This is the focus of social ecology.¹¹

The common ground of the various schools of social ecology is the recognition that the fundamentally anti-ecological nature of many of our social and economic structures and their technologies is rooted in what Riane Eisler has called the 'dominator system' of social organization.¹² Patriarchy, imperialism, capitalism and racism are examples of social domination that are exploitative and anti-ecological. Among the different schools of social ecology there are various Marxist and anarchist groups who use their respective conceptual frameworks to analyse different patterns of social domination.

Ecofeminism could be viewed as a special school of social ecology,

10 See Merchant (1994), Fox (1989).

11 See Bookchin (1981).

12 Eisler (1987).

since it too addresses the basic dynamics of social domination within the context of patriarchy. However, its cultural analysis of the many facets of patriarchy and of the links between feminism and ecology goes far beyond the framework of social ecology. Ecofeminists see the patriarchal domination of women by men as the prototype of all domination and exploitation in the various hierarchical, militaristic, capitalist, and industrialist forms. They point out that the exploitation of nature, in particular, has gone hand in hand with that of women, who have been identified with nature throughout the ages. This ancient association of woman and nature links women's history and the history of the environment, and is the source of a natural kinship between feminism and ecology.¹³ Accordingly, ecofeminists see female experiential knowledge as a major source for an ecological vision of reality.¹⁴

NEW VALUES

In this brief outline of the emerging ecological paradigm, I have so far emphasized the shifts in perceptions and ways of thinking. If that were all that were necessary, the transition to the new paradigm would be much easier. There are enough articulate and eloquent thinkers in the deep ecology movement who could convince our political and corporate leaders of the merits of the new thinking. But that is only part of the story. The shift of paradigms requires not only an expansion of our perceptions and ways of thinking, but also of our values.

And here it is interesting to note the striking connection between the changes of thinking and of values. Both of them may be seen as shifts from self-assertion to integration. These two tendencies - the self-assertive and the integrative - are both essential aspects of all living systems.¹⁵ Neither of them is intrinsically good or bad. What is good, or healthy, is a dynamic balance; what is bad, or unhealthy, is imbalance - over-emphasis of one tendency and neglect of the other. If we now look at our Western industrial culture, we see that we have overemphasized the self-assertive and neglected the integrative tendencies.

13 See Merchant (1980).

14 See Spretnak (1978, 1993).

15 See Capra (1982), p. 43

16 See pp. 34-35 below.

This is apparent both in our thinking and in our values, and it is very instructive to put these opposite tendencies side by side.

| <i>self-assertive</i> | <i>integrative</i> | <i>self-assertive</i> | <i>integrative</i> |
|-----------------------|--------------------|-----------------------|--------------------|
| rational | intuitive | expansion | conservation |
| analysis | synthesis | competition | cooperation |
| reductionist | holistic | quantity | quality |
| linear | nonlinear | domination | partnership |

One of the things we notice when we look at this table is that the self-assertive values - competition, expansion, domination - are generally associated with men. Indeed, in patriarchal society they are not only favoured but also given economic rewards and political power. And this is one of the reasons why the shift to a more balanced value system is so difficult for most people, and especially for men.

Power, in the sense of domination over others, is excessive self-assertion. The social structure in which it is exerted most effectively is the hierarchically ordered, with men generally occupying the upper levels and women the lower levels. Most of these men, and also quite a few women, have come to see their position in the hierarchy as part of their identity, and thus the shift to a different system of values generates existential fear in them.

However, there is another kind of power, one that is more appropriate for the new paradigm - power as influence of others. The ideal structure for exerting this kind of power is not the hierarchy but the network, which, as we shall see, is also the central metaphor of ecology.¹⁶ The paradigm shift thus includes a shift in social organization from hierarchies to networks.

ETHICS

The whole question of values is crucial to deep ecology; it is, in fact, its central defining characteristic. Whereas the old paradigm is based on anthropocentric (human-centred) values, deep ecology is grounded in ecocentric (earth-centred) values. It is a worldview that acknowledges the inherent value of non-human life. All living beings are members of ecological communities bound together in a network of interdependencies. When this deep ecological perception becomes part of our daily awareness, a radically new system of ethics emerges.

Such a deep ecological ethics is urgently needed today, and especially in science, since most of what scientists do is not life-furthering and life-preserving but life-destroying. With physicists designing weapons systems that threaten to wipe out life on the planet, with chemists contaminating the global environment, with biologists releasing new and unknown types of micro-organisms without knowing the consequences, with psychologists and other scientists torturing animals in the name of scientific progress - with all these activities going on, it seems most urgent to introduce 'eco ethical' standards into science.

It is generally not recognized that values are not peripheral to science and technology but constitute their very basis and driving force. During the Scientific Revolution in the seventeenth century, values were separated from facts, and ever since that time we have tended to believe that scientific facts are independent of what we do and are therefore independent of our values. In reality, scientific facts emerge out of an entire constellation of human perceptions, values, and actions - in one word, out of a paradigm - from which they cannot be separated. Although much of the detailed research may not depend explicitly on the scientist's value system, the larger paradigm within which this research is pursued will never be value-free. Scientists, therefore, are responsible for their research not only intellectually but also morally.

Within the context of deep ecology, the view that values are inherent in all of living nature is grounded in the deep ecological, or spiritual, experience that nature and the self are one. This expansion of the self all the way to the identification with nature is the grounding of deep ecology, as Arne Naess clearly recognizes.

Care flows naturally if the 'self is widened and deepened so that protection of free Nature is felt and conceived as protection of ourselves . . . Just as we need no morals to make us breathe ... [so] if your 'self in the wide sense embraces another being, you need no moral exhortation to show care . . . You care for yourself without feeling any moral pressure to do it ... If reality is like it is experienced by the ecological self, our behavior *naturally* and beautifully follows norms of strict environmental ethics.¹⁷

What this implies is that the connection between an ecological perception of the world and corresponding behaviour is not a logical but a *psychological* connection.¹⁸ Logic does not lead us from the fact that we are an integral part of the web of life to certain norms of how we should live. However, if we have deep ecological awareness, or experience, of being part of the web of life, then we *will* (as opposed to *should*) be inclined to care for all of living nature. Indeed, we can scarcely refrain from responding in this way.

The link between ecology and psychology that is established by the concept of the ecological self has recently been explored by several authors. Deep ecologist Joanna Macy writes about 'the greening of the self',¹⁹ philosopher Warwick Fox has coined the term 'transpersonal ecology',²⁰ and cultural historian Theodore Roszak the term 'ecopsychology'²¹ to express the deep connection between these two fields, which until very recently were completely separate.

SHIFT FROM PHYSICS TO THE LIFE SCIENCES

By calling the emerging new vision of reality 'ecological' in the sense of deep ecology, we emphasize that life is at its very centre. This is an important point for science, because in the old paradigm physics has been the model and source of metaphors for all other sciences. 'All philosophy is like a tree,' wrote Descartes. 'The roots are metaphysics, the trunk is physics, and the branches are all the other sciences.'²²

17 Arne Naess, quoted in Fox (1990), p. 217.

18 See Fox (1990), pp. 246-7.

19 Macy (1991).

20 Fox (1990).

21 Roszak (1992).

22 Quoted in Capra (1982), p. 55

Deep ecology has overcome this Cartesian metaphor. Even though the paradigm shift in physics is still of special interest because it was the first to occur in modern science, physics has now lost its role as the science providing the most fundamental description of reality. However, this is still not generally recognized today. Scientists as well as non-scientists frequently retain the popular belief that 'if you really want to know the ultimate explanation, you have to ask a physicist which is clearly a Cartesian fallacy. Today, the paradigm shift in science, at its deepest level, implies a shift from physics to the life sciences.