

## ECO-COSMOLOGY AS THE FOUNDATION OF THE NEW CULTURAL RECONSTRUCTION

A wrong conception of the universe  
Inevitably leads to a wrong conception of life.  
And the result is the inevitable doom.  
(After T. S. ELIOT)

**1. One Cosmology or Many Cosmologies?** Cosmology is an ancient subject. The dawn of Philosophy is in fact the dawn of Cosmology. When Thales, Anaximander, Empedocles and other Greek philosophers in the 6th century B.C. began to abandon mythology and started to think in a new way, this led to a new understanding of the universe. And this was the beginning of both Philosophy and Cosmology. Early Greek Cosmologies were speculative and rather naive. Let us be quite clear that any Cosmology which tries to understand the structure and the origins of the universe is bound to be *speculative*. And so is present physical Cosmology, which has been vigorously developed by the astrophysicists during the last thirty years. Yet present physicists have maintained that past Cosmologies are hardly worth mentioning and that present physical Cosmology, as elaborated by astrophysicists, is the only legitimate Cosmology. Thus John Barrow writes:

«Cosmology is the science of the universe — its size, age, shape, wrinkles, origin and contents. Mankind's oldest speculation, it has been transported in the twentieth century from the realm of metaphysics into the domain of physics, where speculation is not unbridled and where ideas must confront observations<sup>1</sup>».

This statement is not entirely correct, and in fact somewhat misleading. Although physical Cosmology is now «located» within physics, it is not the case that it has been transported from the realm of metaphysics to physics proper. The most far reaching conjectures, concerning the origin of the universe —its wrinkles and all—, are not based on observation, such conjectures cannot be based on observation. They are simply speculations, just like Thales's speculations were, but in a different frame of reference. These speculations are a form of metaphysics. Scient-

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1. John D. BARROW, Life, The Universe and the Anthropic Principle, *The World and I*, August, 1987, p. 179.

ists do not know what they are talking about when they say, particularly with regard to the origin of the universe, that their reflection has left the realm of metaphysics. It is metaphysics, par excellence, according to the straight Aristotelian definition: *ta meta physica*, that which is beyond physics. Barrow suggests that speculation within present physical Cosmology «is not unbridled». One does not really know what he means. Cosmological speculation, particularly of the great cosmologist of the past, have been always «bridled»; that is to say, subjected to severetests of reality — within the concept of reality accepted at a given time. Barrow also suggests that «ideas [of present cosmologists] must confront observation» as well — even the most primitive of Cosmologies. If Barrow wishes to insist that physical Cosmology has to confront *different* kinds of observation, then we shall agree. The main point is this: in their very nature, past and present Cosmologies are similar in structure. They are speculative and highly conjectural. Given the inscrutability of the phenomena they wish to explain (the origins of the universe), these speculations are metaphysical. One more point needs to be added. All Cosmologies are selective in what they consider as proper observations that attest to their validity. They are partly circular: they favor observations that support their claims. That needs to be firmly borne in mind. Therefore is nothing special about present physical Cosmology. If Barrow and others wish to insist that there is, namely, that physical Cosmology gives us the truth about the universe, then they are begging the question. For they are *assuming* that their Cosmology is right, while other Cosmologies are not. This is not a scientific claim. That is a metaphysical claim. If we wish to remain strictly scientific, then we cannot make such a claim.

If we wish to make such a claim however, then we are joining competing metaphysical schools. And we will be judged on a par with other such schools. How do we judge the validity of metaphysical schools? Certainly not by using the criteria of validity of one such school, namely of scientific realism, which is a form of metaphysics. It is rather surprising how naive scientists can be in making metaphysical claims, and in not being aware of it. How to choose a metaphysic is a thorny question. One is inclined to agree with Willis Harman who writes:

«It is futile to seek through research to answer the question “What metaphysic is correct?” The basic reason is that *the research methodology itself grows out of a metaphysics*, so the research tends to lead us the full circle, back to that metaphysics<sup>2</sup>».

Nobody has a monopoly on the term «Cosmology». There are many different Cosmologies; as there are many different philosophies. Empirical philosophy, or physicalism, is one kind of philosophy. Platonism is another kind of philosophy.

2. Willis HARMAN, Scientific Positivism, The New Dualism, and the Perennial Wisdom, *Scientific and Medical Network Newsletter*, Fall, 1986, p. XX.



It would be absurd to deny the name of philosophy to Platonism because some philosophers, inspired by science, wish to consider physicalism is the only genuine philosophy. Even within the realm of the present science, there are quite different Cosmologies; or at least rudiments of different Cosmologies. David Bohm is a physicist known for his work in quantum theory, but also for his speculative theories about the nature of the universe. He contends that we live in an unfolding universe. It unfolds in a very special way — by making the transition from the *implicate* order to the *explicate order*. The implicate order is the state of things *in potentio*. When things unfold, the implicate order becomes the explicate order. What is of real importance is not the postulated transition from potency to actuality —many philosophers have proposed similar ideas— but the way things are envisaged in the implicate order. According to Bohm all things are connected, in a most fundamental, primordial, cosmological sense («the entire universe is basically a single indivisible unit»), so that elementary particles (in the double split experiment, for instance) can somehow «know» what other particles are doing. The idea of implicate order, when sufficiently spelled out, becomes a new Cosmology (more on Bohm in section 4).

The order of the universe has fascinated philosophers and astronomers for millennia. While constructing various Cosmologies, or attempting to understand at least part of the architecture of the cosmos, the philosophers and astronomers of the past were as partial to the idea of truth as present astrophysicists are. But they were also partial to the idea of beauty. Among the great astronomer-philosophers, who speculated on the nature of the order of heaven, was of course Copernicus. For him the order of the universe was both perfect and beautiful— because it could not be otherwise, as the universe was created by a perfect God. Copernicus wrote in *De Revolutionibus*:

«And what is more beautiful than the heavens which contain everything that is beautiful? The names themselves *Caelum* and *Mundus* are an evidence, of which one signifies purity and ornament and the other a work of sculpture. It is because of its exceptional beauty that many philosophers called the heavens simply the visible deity<sup>3</sup>».

It was not unusual for the great scientists and philosophers of the past to see beauty in the architecture of the cosmos and to invest the cosmos (and hence Cosmologies describing the universe) with purpose, meaning and intention. Such is not the case with the present physical Cosmology. But present Cosmology is just one of many! Thus, let us be perfectly aware that the 20th century physicists neither discovered nor invented the idea Cosmology. They have simply appropriated it to their own usage. Often they seem to give the impression that Cosmo-

3. Nicolas COPEPRNICUS, *De Revolutionibus* (On the Revolution of the Spheres), Proemium, 21.



logy did not exist before they invented it. But as I mentioned, Cosmology is a noble and ancient discipline. True enough, when Socrates and Plato came into the scene, a fundamental shift occurred in philosophy — Cosmology ceased to be the center of philosophical concerns. Instead, the philosophy of man became the focus. Yet Cosmology did not disappear either from Western philosophy or from systems of thought of other cultures. Any coherent or even semicoherent system of beliefs, which attempts to explain the structure and the origins of the universe and man's relationship to the universe, is a Cosmology. We therefore can legitimately and justifiably talk about the Cosmology of the Hopi Indians or the Cosmology of Amazon Indians. And indeed perceptive studies have been written on these Cosmologies<sup>4</sup>. In the late 19th century and the first decade of the 20th century, the term Cosmology was hardly used in physics and astrophysics — because the latter hardly existed at the time. Yet anthropologists used the term extensively and meaningfully to explain the belief systems of other people and other cultures. To reiterate the point, we must not presume that our (or scientific) explanation of the structure of the universe is the only legitimate explanation, and that Scientific Cosmology is the only legitimate Cosmology. As we have said, any semi-coherent system of beliefs which tries to explain the structure of the universe, which relates man to the universe and tries to explain man's place in the universe is a Cosmology. Therefore, historically we have had and still have hundreds of different Cosmologies; each is legitimate in its own right. In the 20th century, before astrophysicists rallied around the term, «Cosmology» has been resuscitated, in the philosophical literature, by Teilhard de Chardin, particularly in his opus, *The Phenomenon of Man* (1957). Evolution is, in Teilhard's thinking, the focal point for understanding the origins, the structure, and the meaning of the universe. Evolution is that process which, with a consummate skill, creates new options, new forms of life through which the transformation of matter into spirit occurs. Eco-Cosmology, proposed in this chapter, builds on Teilhard's Cosmology and yet goes beyond it — as evolution always does.

**2. Why Do We Need a New Cosmology?** We need a new Cosmology for a more fundamental reason than we are usually aware. We need it as a new matrix for our action. We need it because our action, performed in the present framework, *continuously misfires*. In this section I will relate action to Cosmology and will show that although three steps removed, Cosmology (this very abstract underpinning of our thought) is very concretely linked with action — via values and philosophy. Our action is never action as such. Our action is always informed and guided. To act does not mean mere doing. More importantly still, acting does not

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4. Cf. for instance G. REICHEL-DOLMATOFF, *Amazonian Cosmos*, Chicago, U.P., 1971.

mean that form of activity which results in self-destruction. Let us emphasize the point. Action does not mean self-destruction. Thus, by action we mean purposeful and meaningful action. Purposefulness and meaningfulness are the attributes of action contained in its very conception. Now, what is *purposeful* and *meaningful* is not determined by action itself. Action is the *executor* of the goals and purposes conceived prior to action. Thus action is directed and guided by goals and desiderata that originate in the sphere outside action itself. What is the nature of these goals and desiderata that guide and direct action? This question I want to examine in some details as it is important for what we are doing now and what we will be doing in the future. The various calls to action, and the various ways of chastising reflection as idle doing, make sense only if we know what action is about. Yet *we can only know what action is about through reflection*. Unreflected action is mindless doing, is thrashing around, or worse, maybe a destructive action. Those simple truths must be reiterated in our age which is dominated by pragmatic philosophies within which action is the king and reflection a pauper. These pragmatic philosophies are based on insufficient reflection. Present technology, present applied science and present economics are equally based on insufficient reflection (regarding economics, see chapter 5, by Thomas Berry, regarding technology, see chapter 8, by Pierre Fornallaz). The point is that many actions have been conceived in their limited frame of reference. Within this limited frame, they appear to be meaningful purposeful. Only when we examine their consequences in larger frames of reference, and over longer stretches of time, do they appear counter-productive. Thus the same action, or the same set of acts, may appear purposeful and meaningful in one frame of reference, and counter-productive in another, larger frame of reference. This situation may seem confusing to the practical man, who is just a doer and does not engage in larger reflection. We may feel compassion for the practical man, but nevertheless hold him accountable for the consequences of his activities in the long run. Such is the meaning of responsibility: you are held responsible for the immediate consequences of your action, and for the delayed consequences of your action. If you give arsenic to another person in small doses, although none of the doses kills by itself, by the accumulative effect, over a period of time, you will kill nevertheless. And you will be charged with murder. Our practical man is the whole technological civilization. This civilization is very impatient in examining the long-term consequences of its activities. Yet, this very civilization seems to be administering to itself small doses of arsenic daily.

At this point of history, we need to go beyond the worn out cliché of our times, which calls men of action heroes and which considers philosophers bums. In going beyond the present cliché, we need to go beyond the *consciousness* that creates the cliché. We need to go beyond the narrow pragmatism which so often (not always, though) has generated unreflected action. We need to re-examine our

values, for values inform and guide our action. In the broadest sense, the values that have guided *meaningful* action in human societies through the millennia are the ones that aim at increasing human happiness or decreasing human misery; of increasing justice or decreasing injustice; of making our lives more beautiful or decreasing ugliness in our lives; of increasing our knowledge and enlightenment or decreasing our arrogance and prejudice; or bringing Heaven to earth or diminishing Hell on earth. Thus truth, goodness, beauty, enlightenment and a sense of grace are the values which have motivated meaningful action through the millennia. Technological society added to these values some new ones: *efficiency*, *control* and also *power*. These new values often seem to be in conflict with the old values. Obviously what will be deemed as meaningful action will be different if, on the one hand, the values of beauty and harmony guide our actions and, on the other hand, the values of efficiency and power guide and determine the meaning of our actions. For Faustian man, who believes that he only lives once and therefore is entitled to everything he wants (at whosoever and whatever expense) the exploitation, even the plunder of the natural environment is a *convenience* required by his high living. For ecological man, who understands interconnectedness of all things and frail balances that prevail and who feels responsible for the future generations, this «convenience» is a crime. Ecological man/woman attempts to cultivate frugality. Faustian man is at the mercy of indulgence. And these two attitudes, frugality and indulgence, spell out different philosophies; each represents a different conception of what life is and should be about. We have moved from the meaning of a particular action to the meaning of action as such; then to values underlying various types of action and activities, then to philosophy underlying and engendering these values. These philosophies merge with Cosmologies; often are particular articulations of various Cosmologies.

Now, the main point of the discussion in this section was to establish that there is a link between Cosmology and action. This link is mediated by two intermediaries, values and philosophies, but it is there all the time.

Cosmology = Philosophy = Values = Action

*As we read the universe so we act in it.* If we read the universe incorrectly, we will act incorrectly. How do we know that we have acted incorrectly? By the kind of lives that will result from the residue of our actions. The final test of our Cosmology is what kind of life it engenders.

We are now returning to the main question of the section: why do we need a new Cosmology? Because our action misfires; misfires on the level of the whole culture, on the level of the whole globe. It is not readily understood, if at all, that to mend action which continually misfires, we need something else than action of a very similar kind. For these two very similar kinds of actions are usually guided



and directed by very similar values and visions. If action continually misfires, we need to go deeper into the underlying matrix in order to realize that inappropriate values may be the reason. But these values stem from certain philosophies — which in turn are influenced and determined by certain conceptions of the cosmos, which are of course our Cosmologies. Thus the manner in which we interpret the cosmos — what is it? what does it contain? how has it come about? what is its destiny? what is our place in it? — filters down to the level and meaning of our actions. (As we read the universe so we act in it.) Cosmology is the last link of the chain («The buck stops here»). Cosmology justifies ultimately all other endeavors and itself is not justified any further, except retroactively — by the consequences it brings to our lives. For some people, it is of course religion which is the last link of the justification chain. But religion is a form of Cosmology. The choice of our Cosmology determines for us not only the image of the world but also the meaningfulness of our actions. For Cosmology defines not only the physical universe outside ourselves. It also indirectly defines our place in it. If we assume that the universe is nothing but physical matter, we have great difficulties accommodating spirituality in this universe. If the universe is assumed to be divine, our spirituality follows naturally — as an inherent aspect of this universe, not an anomaly. If the universe is assumed to be orderly and harmonious, we are encouraged and invited to envisage our lives as harmonious and connected.

If the universe is assumed to be chaotic, or worse, a garbage pit, we are allowed, and in a sense encouraged, to look at our lives as worthless; or worse still, as garbage reflecting the garbage of the universe. (This, unfortunately, may be the case with many lives, although people are not quite aware of how the low image of themselves is a consequence of the poor image of the universe imposed on them.) *Our lives are the mirrors in which the fundamental characteristics of the universe, as we understand it, are reflected.* Thus, if we wish to insist on the meaningfulness of our lives, on their purpose and beauty, we better assume that the universe has meaning purpose and beauty. Even if we cannot *prove* it with regard to the physical universe, it helps us to maintain the coherence and meaning of our own lives. *To assume an inherent purpose of the physical universe out there is thus a methodological imperative which helps us to govern ourselves in the human world.* It can be said that I cannot prove my assumption. In response I can say that nobody can *disprove* it in the strict scientific sense. In any case, this is the assumption which the traditional Cosmologies have made, namely that the universe is purposeful, meaningful, beautiful, hospitable and sympathetic to man's striving. This is what Eco-Cosmology also assumes, namely that the universe is home for man, and we are its stewards, custodians and guardians. Moreover, given our unique role in the universe, given the creative nature of the mind, it is safe to assume that we co-create with the universe and contribute to its

destiny. Before we go into details of Eco-Cosmology, let us take a brief look at the legacy of the mechanistic Cosmology.

**3. The Legacy of the Mechanistic Cosmology.** The metaphysical and cultural reconstruction of our time is not merely tinkering with environmental problems (as important as they are), but addressing ourselves to the fundamental causes underlying our multiple crises. These causes go beyond the economic and technological. They even go beyond the moral. These crises are embedded in the underlying matrix of our world view, our Cosmology. What has been backfiring on us are the shortcomings of our Cosmology, of our world view, which is now functioning as a strait-jacket. *The Mechanistic Cosmology at present provides a deficient code for reading nature. Hence our deficiency in interacting with nature.* The Mechanistic Cosmology, with its abstract non-compassionate rationality provides an inadequate basis for social and human orders. Hence, the variety of rational models, evolved under the auspices of scientific rationality so often are part of the problem, not a solution to human and social dilemmas. Our world view and our lifestyles are intimately connected. The mechanistic conception of the universe, in the long run, *implies* and *necessitates* the human universe which is cold, objective and uncaring. As the consequence, the human meaning atrophies. This point needs to be quite clearly spelled out, namely, that the atrophy of meaning and the triumph of the quantity are closely related. Let us put it differently. Meaning and number do not co-habit well together. In the scientific-objective model human meaning cannot be coherently accommodated, if only because the very language and categories of the model do not allow for the expression of the meanings of our humanness. Thus, the atrophy of human meaning, in the mechanistic system is not the result of benign neglect. Rather it is an *essential consequence* of the Mechanistic Cosmology. Now, the philosophical codification of the Mechanistic Cosmology is the doctrine called empiricism. David Hume in his *Inquiry Concerning Human Understanding* is perhaps the best expositor of this doctrine. Hume wrote:

«When we run over libraries, persuaded of these principles, [of empiricism] what havoc must we make? If we take in our hand any volume; of divinity or school metaphysics, for instance; let us ask: *Does it contain any abstract reasoning concerning quantity or number?* No. *Does it contain any experimental reasoning concerning matter of fact and existence?* No. Commit it then to the flames: for it can contain nothing but sophistry and illusion<sup>5</sup>».

This is a classic paragraph. The philosophy of empiricism put in a nutshell. And devastating to theology, metaphysics, and actually all philosophy! Also to the

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5. David HUME, *A Treatise Concerning Human Understanding*, the last paragraph.

meaning of human life; as well as to Hume's treatise itself. If we were to take Hume for his word, we would want to throw his *Inquiry* into the flames — as it is neither concerned with quantity nor number, but with metaphysical speculations about each. The ghost of Hume has been haunting all the edifices of so-called rational knowledge. A curious paradox is that we want to be good empiricists, regardless whether we understand the consequences of empiricism or not. We all want to base our discourse and reasoning on fact and number — because such are the dogmas of our present Cosmology. The influence of the Mechanistic Cosmology is still paramount in the present Western society. We know that this Cosmology is inadequate. We know that some of its consequences are pernicious. We know that an unmitigated pursuit of objectivity is a somewhat paranoid quest. We know that alienation, atomization and decimation of society, of natural habitats, of individual human existences, are partly the result of the structure of knowledge which incessantly atomizes, isolates and separates.

We have made various attempts to ameliorate the situation. However, the main imperatives of our Cosmology are still holding us in their grip: to quantify, to objectify, to «thingify». What is therefore of great importance is not only a thorough examination of the nature of this Cosmology, but an imaginative endeavor to create and spell out alternative Cosmologies which would provide an antidote to the Mechanistic Cosmology, an alternative vision of the universe; as well as a set of alternative strategies for its exploration, including alternative modes of thinking and alternative modes of justification. Eco-Cosmology attempts to be this kind of endeavor. It not only wishes to critique the existing Cosmologies, but it wishes to construct a new cosmological scaffolding, a new matrix, through which we can interact with the cosmos and ourselves in a new way; and within which «quantity and number» and «experimental reasoning concerning matter of fact» are to be confined to their proper place and a rather modest place, and not worshipped as deities. Our civilization is at a new juncture, at crossroads, and we need a new Cosmology so that we can get somewhere. To say it once more, Cosmology provides the roots out of which the multitude of things grow. «A wrong conception of the universe implies somewhere a wrong conception of life, and the result is the inevitable doom».

**4. The Structure of Eco-Cosmology.** The architecture of Eco-Cosmology is supported by the seven main pillars: (1) the Anthropic Principle; (2) evolution conceived as the process of creative becoming; (3) the Participatory Mind; (4) the Implicate Order; (5) the Theology of Hope; (6) Reverence for life; (7) Eco-Ethics.

1. Eco-Cosmology accepts the fact of the existence of the physical universe, which emerged from its primordial, mysterious beginnings some 15 billion years ago. Eco-Cosmology accepts the essential mystery of the very origin of the uni-

verse. This mystery is part of the beauty of the universe. Eco-Cosmology accepts the conclusions of present astrophysics concerning the size, density and the properties of the physical universe in its cosmic evolution. These conclusions point out that the phenomenon of life is not only possible but indeed inevitable — given the structure of the universe and the unique constraints, as explained by the cosmological constants. Freeman Dyson writes: «As we look out into the universe and identify the many accidents of physics and astronomy that have worked together to our benefit, it almost seems as if the universe must in some sense have known that we were coming». Why is the universe as it is? Because we are here. It is indeed a staggering realization that the composition of the universe is so exquisitely balanced that it makes life not only possible, but perhaps necessary. This insight has led to the formulation of the Anthropic Principle<sup>6</sup>. The Anthropic Principle simply stated maintains that the rate of the universe is bound with the fate of the human (Anthropos). The Anthropic Principle has many formulations, one of which is that the universe must necessarily have given rise to intelligent life. As we search deeper and deeper in to the underlying structure of the cosmic evolution, we are more and more convinced that «the coincidences» may not have been so coincidental but rather fragments of a larger pattern. As our knowledge and hypotheses grow subtler and deeper, the universe seems to be revealing to us its subtler and deeper features. This is how it ought to be: the subtler the mind, the subtler are the phenomena it discovers. The Anthropic Principle, translated into the language of Eco-Philosophy, means that the universe is home for man. We are its legitimate dwellers, not some kind of cosmic freaks. In a sense we are its justification: the tremendous cosmic changes are beautifully explained by the fact of the existence of life endowed with intelligence. Yet, on another level, the conception of the universe as home for man —and we as its custodians— implies that we are responsible for our fate and for all there is.

2. The second basic pillar of Eco-Cosmology is evolution conceived as a process of creative becoming. This is the view of evolution which Teilhard de Chardin holds — evolution as an ever growing process complexity, in the wake of which new layers of consciousness emerge. Now the complexity-consciousness thesis, explaining the main modus of evolution, does not necessarily entail the idea of Predetermined Design; or the idea of God, who is brought through the back door. But the thesis of complexity-consciousness does challenge the claims of narrow Darwinians who surmise that evolution is a stupid monkey, who sits at the typewriter and (given almost infinite time) by pure chance, types all the works of Shakespeare. No, evolution is more subtle than that. If the Anthropic Principle

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6. Cf. John D. BARROW and Frank J. TIPLER, *The Anthropic Cosmological Principle*, New York, Oxford University Press, 1986.

may be said to be a force endowed with some intelligence, then evolution is no less intelligent. Let us make an important connection. Evolution as a process of incessant becoming, within which the growth of complexity parallels the growth of consciousness, can be seen as an aspect and an articulation of the Anthropic Principle. Teilhard was not aware of it — nor could he be, as he wrote his main opus in the 1930s. The chief proponents of the Anthropic Principle do not seem to be aware of it either. But here it is: after the cosmological constants, as understood by the Anthropic Principle, had done their work (during the first twelve billion years of the cosmological evolution), the next stage of this evolution required a new vehicle: a specific vehicle to articulate life out of the well-established cosmological/chemical niches. This vehicle is evolution. *Conceiving of evolution as a creative force, which ceaselessly articulates life in ever new forms of consciousness, is not only congruent with the Anthropic Principle, but a necessary extension of it.* Teilhard's reconstruction of evolution is compelling enough<sup>7</sup>. But it becomes even more compelling when we realize that this reconstruction (and this view of evolution) is an aspect of the Anthropic Principle. In order not to stop a grinding halt, the Anthropic Principle had to conceive of a force to articulate life *more explicitly*. This force is evolution. Thus the Anthropic Principle articulates itself through creative evolution. Creative evolution represents a continuation of the early works of the forces of the cosmological constants. Now we have connected the first twelve billion years of evolution (the Anthropic Principle) with its next four billion years (Creative Evolution). It is one unfolding process.

3. The Participatory Mind is the third pillar of Eco-Cosmology. A Cosmology which only gives us a picture of the world, excluding the human being, and which does not specify how we —humans— interact with what is out there, is essentially incomplete. Eco-Cosmology, while accepting the tenets of the Anthropic Principle, and of the heritage of creative evolution, also outlines a theory of the participatory mind. The participatory mind is born out of these subtler readings of the structure of the universe. The immediate predecessor of the participatory mind is Wheeler's conception of the participatory universe. John Archibald Wheeler writes:

«The universe does not exist «out there» independent of us. We are inescapably involved in bringing about that which appears to be happening. We are not only observers. We are participants. In some strange sense this is a participatory universe<sup>7</sup>».

The idea of the participatory universe is a beautiful one. Read in depth it entails

7. For further discussion, cf. P. TEILHARD DE CHARDIN, *The Phenomenon of Man*; cf. also H. SKOLIMOWSKI, *Eco-Philosophy*, 1981, and *The Theatre of the Mind*, 1985. Now, by accepting the overall thrust of Teilhard's reconstruction of evolution, we do not necessarily accept every tenet Teilhard maintained about evolution.



in its very meaning the participatory mind. The idea of the participatory mind occurred to me while I was simultaneously contemplating two large legacies: the legacy of Teilhard's vision of evolution —in which the role of the mind is somewhat neglected, and the legacy of the new readings of the cosmos by astrophysics— in which the universe is conceived as participatory and yet the mind is not present. The idea of the participatory mind just emerged with luminosity as this element which makes sense of the participatory universe and which simultaneously is indispensable for the understanding of evolution as the process of becoming through the increase of consciousness. The conception of the participatory mind maintains that mind is present in *all* products of our knowledge and in *all* pictures of the world. We are bound by the *Noetic Condition* — by the presence of our mind in all the forms of our knowledge and of our understanding. Whatever we receive from the world is filtered through our mind. If it is not filtered, it is not received. If we were a different species, and would possess an altogether different structure of mind, our pictures of the world and all our understanding of it would be different. Therefore, while bound by our mind, which is the shaper of reality, we can never describe the cosmos *as it is*. *We always partake in what we describe*. Our description is a fusion of our mind and «what is there». Our mind invariably and tirelessly elicits (through its various faculties and sensitivities) from the amorphous primordial givens of the universe<sup>8</sup>. When evolution became conscious of itself that meant the arrival of self-consciousness. As self-consciousness articulates itself, it begins to perceive that it is participatory consciousness, which co-creates with the universe and completes the meaning of the participatory universe. The Anthropic Principle thus was bound to articulate itself in the form of participatory consciousness which we call the participatory mind. We shall emphasize: given is never given as such. Given is always mediated, influenced, molded, shaped and determined by the mind. This is the meaning of the participatory mind. If anything is registered, let alone formulated and articulating in our mind, or better still, expressed in the language and the annals of our knowledge, it is already filtered and structured through the mind. The idea of the participatory mind enhances freedom and dignity of the human individual. To give justice to our participatory mind, means, in a sense to be doomed to co-create with the universe. The awareness of the creative power of our mind only emphasizes our responsibility for our own lives, for the fate of the earth, for the fate of the universe. The universe is responsible for our birth. Now we are responsible for its fate.

#### 4. Another part of the overall structure of Eco-Cosmology is what David

8. For further discussion, cf. H. SKOLIMOWSKI, *The Theatre of the Mind*, and also, *The Interactive Mind in the Participatory Universe, The Real and the Imaginary* (Jean CHARON, ed.), New York, Paragon House, 1987.



Bohm calls the Implicate Order. The Implicate Order is a principle similar to the Anthropic Principle. It attempts to convey some of the essential characteristics of the universe in its unfoldment. Our language is invariably a language of parts, very good to describe atoms, but not genuinely adequate to describe complex wholes, let alone the universe in its unfolding. Therefore David Bohm and his followers use analogies. One of the analogies which Bohm and others use to convey the meaning of the Implicate Order is the following. Suppose we drop a drop of ink on the top of the smooth surface of a cylinder of glycerine. We now rotate the cylinder around its axis. The drop becomes a smudge, then disappears; at least to our eyes. But it is there. If we rotate the cylinder back, we will bring it back to existence. In a similar kind of way, the burst of the universe is a drop of ink in which all the parts are connected. According to Bohm, the elementary particles in the double split experiment are not only connected, but *aware* of its other existence, bound by the cosmological bond of its primordial origin<sup>9</sup>. The universe, based on the acceptance of the Implicate Order, is wholistic par excellence. In this universe all elements are co-dependent on each other, and co-determine each other. In the words of David Bohm: «It seems necessary to give up the idea that the world can correctly be analyzed into distinct parts, and to replace it with the assumption that the entire universe is basically a single indivisible unit. Only in the classical limit can the description in terms of component parts be correctly applied without reservations. Whenever quantum phenomena play a significant role, we shall find that the apparent parts can change in a fundamental way with the passage of time, because of the underlying indivisible connections between them. Thus, we are led to picture the world as an indivisible, but flexible and ever changing, unit<sup>10</sup>». The idea of the wholistic nature of the universe is not new. What is new is Bohm's justification of it. New ecological consciousness, which has been emergin during the last 20 years, made people aware that nature is one wholistic system. Its elements are co-dependent with regard to each other and determine each other. This subtle network of life is of such a nature that if we touch one point of this network, the whole network reverberates, as all elements are connected. This we have learnt from the Ecology Movement and its aftermath. To what extent David Bohm's cosmological conceptions have been influenced by the thinking of the Ecology Movement is an open question. It would be fair to guess that there must have been some influence, as the Ecology Movement had articulated the wholistic and co-dependent conception of nature before Bohm's major ideas appeared on the scene. But we shall not press the point. It is very likely that Bohm may have arrived at his ideas independently. If so, the *Zeitgeist* works through us all. *What is important to realize is the fact that the*

9. For further discussion, cf. David BOHM, *Wholeness and the Implicate Order*, 1981.

10. Cf. *ibid.*

*conception of a wholistic and co-dependent universe can be rationally upheld on the scale of nature in ecological habitats and on the scale of the whole universe.* This only reinforces many of the conclusions of Eco-Cosmology we have reached so far. Let us reflect on the architecture of Eco-Cosmology we have constructed thus far. It may be said that: (a) The Anthropic Principle is the foundation; (b) Evolution is the temple built on this foundation; (c) We are the singers singing Gregorian chants in the temple. Our discussion so far has centered on this part of the structure of Eco-Cosmology which can be articulated in cognitive terms, and which draws from the insights and findings of recent science. The three remaining pillars or principles are related to the ethical order of the human universe — as this order interacts with the natural order.

5. Hope is the fifth pillar of Eco-Cosmology. Hope is part of our ontological structure. Hope is a mode of our very being. To be alive is to live in a state of hope. Hope is the scaffolding of our existence. Hope is a re-assertion of our belief in the meaning of human life; and in the sense of the universe. Hope is the precondition of all meaning, of all strivings, of all actions. Hope is a celebration of aweness. Hope is an essential quality of being human. Hope at first does not seem to be an inherent part of Eco-Cosmology. But on a deeper analysis it is important to Eco-Cosmology for three reasons. Hope is a vector of continuous transcendence, thus indispensable for the unfolding of evolution on the human level. Hope is a vital dimension of the participatory mind. When our hope crumbles, we crumble. When our hope is asserted, we are alive and participating. Thus, in a subtle way, *hope is the will and the fuel of our participatory mind*. And thirdly, and most importantly, hope is necessary for our existence in this world as beings of a certain kind, who need affirmation, compassion, solidarity and courage. The logic of hope is the logic of affirmation. The logic of hope is the logic of solidarity. The logic of hope is the logic of compassion. The logic of hope is the logic of courage. The logic of hope is the logic of responsibility. All these attributes: affirmation, solidarity, compassion, courage, responsibility are the very stuff of which life is made; that is life which is lived in harmony and wholeness. Can there be a Cosmology in which hope does not play any part? Perhaps. But in Cosmologies created by living human cultures, hope has always been included as an essential element of man's affirmation of the universe and of himself. Cosmology is an affirmation of the universe. Hope is part of this affirmation.

6. Reverence for life is another pillar of Eco-Cosmology. Reverence has an ethical component and a cognitive component and the two cannot be easily separated. Reverence is paying homage to life and to all there is. Reverence is a consequence of our awareness of the dazzling magic of the cosmic and evolution-

nary developments<sup>11</sup>. *When we truly become aware how glorious is the architecture of the universe, how intricate is the tapestry of evolution, how exquisite are the powers of the human mind, and how all these forces of the universe are orchestrated together in one stupendous symphony, our reaction cannot be but of awe and reverence.* Thus reverence appears as an act of an in depth comprehension — not bits and pieces, here and there, but of the glorious whole, working together. There is no *logical* necessity to describe the world as reverential. Yet for the appreciative and sensitive mind, reverence for life appears as a natural acknowledgement of the miracle and the beauty of life. Once we establish a reverential frame of reference with regard to the universe and to the phenomenon of life, we can then extend it to the instances of particular lives of various other species, of various other people, of ourselves. The reverential attitude is one which enables us to view the entire cosmos in a new way. Compassion and empathy are the modes of awareness which are known to us all. In some Eastern religions, such as Buddhism and Hinduism, compassion and empathy are not only used as expressions of pity and sympathy, but indeed as modes of knowing. In order to understand another person in depth (and perhaps the same applies to the universe at large) we need to use more than mere abstract, cold intellect. We need to use compassion. *Compassion is reverential understanding.* It should be immediately clear to us all that what is required for the healing of the planet and for the mending of the multiple, ecological and social damages is this deeper comprehension, based on compassion and the true recognition of the brotherhood of all beings. Thus reverence, as a form of understanding, becomes a firm pillar of our ecological *Weltanschauung*.

7. Ecological Ethics is an extension and articulation of the idea of reverence for life. In a subtle way it is also an articulation of the idea of the implicate universe and of the idea of creative evolution. Let us now clearly see the architecture of Eco-Cosmology. Although three steps removed, Eco-Ethics nevertheless partakes in the meaning and the overall purpose of the Anthropic Principle. In order to proceed with its project of creating life the articulating it, the Anthropic Principle not only had to create cosmological constants, but had to create evolution as a more specific vehicle of the articulation of life. That much clearly follows. Furthermore, the participatory mind had to be created as the part of the unfolding intelligence. Moreover in the universe of wholeness and co-dependence, particularly in the universe of human co-dependence and solidarity, specific vehicles had to be created to carry on the heritage of life on the social, ethical and

11. For further discussion of Reverence, cf. H. SKOLIMOWSKI, *Eco-Philosophy, Designing New Tactics for Living*, 1981; also *Eco-Theology, Toward a Religion for Our Times*, Eco-Philosophy Publications, 1985.

spiritual levels. Reverence for life, and ecological ethics are such vehicles. If life did not create ethical forms of behaviors, which safeguard the heritage of life, then the works of the Anthropic Principle could be in jeopardy. What we are proposing is that Ecological Ethics is not an invention of weeping ecological softies, but a historical necessity following from the plan of the universe as it unfolds itself from the Anthropic Principle, via creative evolution, via the participatory mind to flower in compassion and reverence. What are the basic values of Eco-Ethics? Some of them have been already mentioned, if only implicitly. One is *reverence* for life. Another is *responsibility* for our own lives, and for the entire cosmos — insofar as we are capable of pursuing it. The third value is *frugality* understood as grace without waste, or as a pre-condition of inner beauty — frugality conceived not as an abnegation or imposed poverty, but as doing more with less; as experiencing life rich in ends though slender in means. Although it doesn't seem so important at first, frugality, in our individual lifestyles and in our transactions with nature, is terribly important — given the frailty of the earth and the battering it has received. To behave frugally is to show a true solidarity with the planet and its creatures. Another important value of Eco-Ethics is the pursuit of wisdom as contrasted with the pursuit of mere information. Yet another important value is one of self-actualization as contrasted with material consumption. The universe wants us to be wise if only because we can then be intelligent partners and truly appreciate its riches. The universe wants us to pursue the path of self-actualization because only then can we become whole and connected persons. And in consequence, take the responsibility for all there is — be mindful guardians, custodians, and good shepherds, not plunderers. Ecological Ethics clearly follows from a correct understanding of the heritage of life and of evolution<sup>12</sup>. As we can see, the architecture of Eco-Cosmology is neither chancy nor whimsical. All its parts are coherently connected together. We are in the midst of a profound knowledge revolution. Old patterns of interpretation and perception are bursting like soap bubbles. New pieces of knowledge are crying for integration. This integration is an imperative of our times. The creation of new philosophies which would attempt to integrate new explosions of knowledge, philosophies which would not only integrate knowledge with the human world, but also attempt to integrate and heal the human being inside; the creation of such philosophies —wholistic and integrative— is a task which is both supremely challenging and supremely important. My own contribution, concerning the nature and the integrative powers of Eco-Cosmology, is a small part of a daring effort which

12. For further discussion of Eco-Ethics, cf. IDEM, Eco-Ethics as the Foundation of Conservation, *The Environmentalist*, 4, 1984, Supplement No. 7; Ecological Values as the Foundation for Peace, *Ecospirit*, Vol. II, No. 3, 1986; and Reverence For Life, *Ethics of Environment and Development* (Ronald ENGEL, ed.), Belhaven Press, 1990.

aims to provide a new foundation for a civilization which is stuck and which desperately wants to receive a new lease of life. A cosmological perestroika is a task vital for the succeeding reconstructions.

**5. A Postscript on Eco-Praxis.** Let me notice that although many people would not recognize themselves as architects of a new Cosmology, which I called Eco-Cosmology, they are in fact actively participating in creating one. We are all concerned with cleaning dumps. And many of us are working actively to reduce the hazardous consequences. This is practicing Eco-Praxis. We are all concerned with reducing the air pollution in our cities, and many of us try to do something about it. We have been all happy when the ban on the use of DDT was announced — as we didn't cherish the idea of being slowly poisoned as the result of it trickling through the food chain. Most of us are quite happy that the ban on cigarette smoking is gradually enforced in most public spaces. All those acts: of cleaning the air in the cities, of eliminating DDT from the food chain, of eliminating cigarette smoke from our immediate living environments, are acts of Eco-Praxis. We want to have clean environments and clean air. We want to have non-polluted bodies, free of the toxins which in the long run will produce cancer and other diseases. We want our universe to be clean and unpolluted. Why? What is the deeper reason that makes us desire a clean universe and demand one? What if the universe is a garbage can? What if our bodies are garbage cans? Intuitively, we abhor such notions. Why? Because we somehow *assume* that the universe is not a garbage can. We *assume* that the universe is a harmonious and coherent place. We further *assume* that our bodies are wonderful pieces of cosmic machinery:

«What a piece of work man is!  
How noble in reason!  
How infinite in faculty!» (Shakespeare).

All these assumptions are related to our larger Cosmology. Only if we accept this larger cosmological matrix, which spells for us a positive view of the universe, only then can we justifiably claim that we have the right to live in unpolluted environments. Only then do we have the right to refuse the claim that life is a case of terminal cancer and instead claim that life is a radiant force of enduring beauty. Through those various acts of Eco-Praxis (which are practiced by many and acknowledged as salutary by all) we are in fact contributing to the new emergence of Eco-Cosmology. The practical implications of Eco-Cosmology are recognized by all. The cosmological basis from which these practical implications follow is elusive to many. Yet the two-praxis and cosmology are connected and interwoven with each other.

**Conclusions.** Cosmologies are not arbitrary creations of certain groups of people who fantasize about the cosmos. The creation of a Cosmology is a rational response of a given people to their way of experiencing reality. Now the experience of reality is never raw, but always mediated by the mind. *The mind of a given people is inherently woven in the Cosmology of the people.* As mind allows and guides us, so we build — our lives, our cultures, our Cosmologies. In our day and age, when our consciousness is constantly impinged upon by ecological dilemmas, by the awareness of the frailty of the planet, and the awareness of the frailty of our lives in the frail design, our consciousness is slowly «greening», is becoming ecological consciousness. This ecological consciousness is a part of our new mind and new sensitivities which inform us that we must attempt to weave a new pattern of our interactions with nature and with the cosmos. Ecological consciousness represents the interiorization of the principles of Eco-Cosmology. Eco-Cosmology is a summation of the various attempts which aim at healing the earth; or simply, of creating a new matrix of our interaction with the cosmos. *The cosmological matrix is never a mere lexicon for reading the cosmos as it is. The cosmological matrix is a set of policies for interaction.* In the Mechanistic Cosmology, this set of policies for interaction is reduced to: control and manipulate, while nature must oblige. In traditional Cosmologies, this set of policies for interaction usually involves a reciprocal give and take, based on participation rather than coercion. There is a global reconstruction which is going on in various parts of the world aiming at creating a new paradigm. This global reconstruction invariably, though often subconsciously, implies a larger cosmological matrix, which attempts to redefine creatively the multitude of things: the perception of the universe, our reading and describing it, the appropriate modes of acting in it; and last but not least, appropriate ways of treating each other. The four components mentioned: perceiving, describing, acting, treating each other are reciprocally dependent on each other. If we perceive the cosmos reverentially, this leads us to reverential descriptions, and reverential actions, and a reverential treatment of each other. If we perceive the cosmos mechanistically, this leads us to mechanistic descriptions and to a mechanistic treatment of each other. Let us be quite clear: unless we perceive the cosmos reverentially, we cannot hope to act, in it reverentially, that is appropriately — healing rather than harming. Eco-Cosmology here outlined may be said to follow the Anthropic Principle. (a) The Anthropic Principle is the foundation; (b) Creative evolution is the temple built on this foundation; (c) We are the singers singing Gregorian chants in the temple. The universe gave birth to us — its special form of creation. The universe wants us to succeed. We may consider ourselves special without presuming that we are superior. Now if we are here with a special purpose in this universe, wouldn't this purpose be to help the universe in manifesting further what it contains in potentio? Eco-Cosmology will not be the ultimate design of our philosophical imagination. But in



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embracing the cosmos in a ferociously participatory and reverential manner, we are giving a testimony that we are its worthy sons and daughters.

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## Η ΟΙΚΟ-ΚΟΣΜΟΛΟΓΙΑ ΩΣ ΒΑΣΗ ΓΙΑ ΤΗ ΝΕΑ ΠΟΛΙΤΙΣΤΙΚΗ ΑΝΑΣΥΓΚΡΟΤΗΣΗ

### Περίληψη

Κεντρική ιδέα του άρθρου είναι η άποψη ότι η κοσμολογία μας συνδέεται άμεσα με τη ζωή και τον πολιτισμό μας. Δεν είναι η κοσμολογία μια άφηρημένη κατασκευή αλλά η όρθολογική απάντηση στο ερώτημα για τον κόσμο, απάντηση που συνδέεται με τον τρόπο που αντιλαμβανόμαστε την πραγματικότητα. Όμως η αντίληψη της πραγματικότητας δεν είναι ποτέ άμεση και «καθαρή» — κατά τον συγγραφέα είναι πάντοτε αποτέλεσμα διαμεσολάβησης του νοῦ κι ἔτσι ὁ νοῦς μας είναι ἐγγενῶς συνυφασμένος με την κοσμολογία μας, ἄρα ἡ κοσμολογία μας συνδέεται ἄμεσα με τη ζωή και τον πολιτισμό μας, ἀφοῦ ὁ νοῦς είναι που διαμορφώνει καὶ τὴ ζωή καὶ τὸν πολιτισμό.

Τὸ ἄρθρο χωρίζεται σὲ πέντε ἐνότητες. Στὴν πρώτη ὁ συγγραφέας διαπιστώνει —μὲ μιὰ ἱστορικὴ ἀναδρομή— ὅτι ὑπάρχουν περισσότερες ἀπὸ μιὰ κοσμολογίες καὶ ὅτι καμιά δὲν ἔχει δικαίωμα νὰ διεκδικεῖ τὰ πρωτεῖα, τουλάχιστον μὲ ἐπιστημονικὰ κριτήρια. Στὴ δεύτερη ἐνότητα καταλήγει στὸ συμπέρασμα ὅτι χρειαζόμαστε μιὰ νέα κοσμολογία ὡς μήτρα τοῦ τρόπου ζωῆς καὶ πράξης μας, διότι ἡ κοσμολογία μέσω τῆς φιλοσοφίας καὶ τῶν ἀξιῶν προσδιορίζει τὶς πράξεις μας κι αὐτὲς μὲ τὴ σειρά τους καθρεφτίζουν τὸν τρόπο κατανόησης ἐκ μέρους μας τοῦ σύμπαντος. Στὴν τρίτη ἐνότητα κάνει κριτικὴ στὸ μοντέλο τῆς μηχανιστικῆς κοσμολογίας ποὺ δεσπόζει ἀπὸ τὸν περασμένο αἰῶνα στὴ σκέψη μας καὶ στὴ ζωή μας καὶ καταλήγει ὅτι σήμερα βρισκόμαστε σ' ἓνα σταυροδρόμι κι ὅτι χρειαζόμαστε μιὰ νέα κοσμολογία. Στὴν τέταρτη ἐνότητα προτείνει τὸ μοντέλο τῆς οἰκο-κοσμολογίας, πού, ὅπως λέει, στηρίζεται σὲ ἑπτὰ «κολόνες»: τὴν «ἀνθρωπικὴ» ἀρχή, τὴν ἐξέλιξη ὡς δημιουργικὸ γίγνεσθαι, τὸν συμμετέχοντα νοῦ, τὴν ὑπονοούμενη ἢ κρυφὴ τάξη, τὴ θεολογία τῆς ἐλπίδας, τὸ σεβασμὸ στὴ ζωή καὶ τὴν οἰκολογικὴ ἠθική. Ἡ πέμπτη καὶ τελευταία ἐνότητα χαρακτηρίζεται ὡς ὑστερόγραφο στὴν οἰκολογικὴ πράξη. Καταλήγοντας ὁ συγγραφέας παρουσιάζει τὴν ἄποψή του μὲ μιὰ ποιητικὴ εἰκόνα: τὰ θεμέλια



Η ΟΙΚΟ-ΚΟΣΜΟΛΟΓΙΑ ΩΣ ΒΑΣΗ ΓΙΑ ΤΗ ΝΕΑ ΠΟΛΙΤΙΣΤΙΚΗ ΑΝΑΣΥΓΚΡΟΤΗΣΗ

τοῦ ἀρχιτεκτονήματος τῆς οἰκο-κοσμολογίας εἶναι ἡ «ἀνθρωπική» ἀρχή, ἡ δημιουργική ἐξέλιξη εἶναι ὁ ναὸς ὁ χτισμένος πάνω σ' αὐτὰ κι ἐμεῖς εἵμαστε οἱ ψαλμῶδοι ποὺ ψάλλουμε γρηγοριανὰ ᾄσματα μέσα στὸ ναό.

H. SKOLIMOWSKI

Ἑλλ. μετάφραση: Γ. Ἀλατζόγλου-Θέμελη

