

## Science and the Environment: Is Science Responsible for Environmental Crisis?

Dr. Ibrahim Ozdemir

**OZET:** Bu çalışmanın amacı çevre krizinin oluşumunda hakim bilim anlayışının rolü ve fonksiyonunu araştırmaktır. Birçok çevreci düşünürü çevre krizinin köklerini araştırırken hakim bilim anlayışını da eleştirmişlerdir. Burada sorulan ve cevaplandırılmaya çalışılan soru şudur: Çevre sorunlarının ortaya çıkmasında sorumlu olan modern pozitivist bilim anlayışı mıdır, yoksa bilimin kendisi midir? Burada bilimden sadece, zamanımızda hakim olan ve diğer bilim anlayışlarını dışlayan pozitivist bilimi anlamadığımız açıktır. Böylece, çevre sorunlarından bilim sorumlaysa bu son iki yüzyıl boyunca hakim olan pozitivist ve materyalist bilim anlayışları bu şekilde suçlanamaz. Bunun bir sonucu olarak da, hakim pozitivist bilim anlayışı son onlu yıllarda çok büyük eleştirilere maruz kalırken, insanlığı diğer bilim gelenekleri de yeniden keşfedilmeye başlanmıştır. Buna bilimin postmodern zamanlarda yeniden tanımlanması da denmektedir.

### I. Introduction

When environmental problems appeared in a great scale after World War II, they were regarded *prima facie* as merely technological problems, which can be solved and corrected by technological means. However, in the course of time, it was understood that environmental problems have more complicated and deep causes than as they appeared. So, some philosophers pondered over the crux of these problems. Lynn White, for example, argued, in the late 60s, that it was Christianity that used to lie at the root of ecological crises.<sup>1</sup> Since the publication of White's seminal article, a furious dispute has taken place on the nature and core of the problem in question.<sup>2</sup> In this context, the role of science and its influence with regard to environmental problems has also been investigated and discussed by many environmentalists and men of thought. They argue "science and technology in their current manifestation pose a profound threat to the future of mankind. While this threat has its clearest form in the shadow of the nuclear bomb, there are the no less dangerous problems of environmental destruction, and community disintegration."<sup>3</sup> In addition, there are some eco-philosophers who look science upon the main causes of all environmental and environment-related problems.

"most of our crisis, particularly the economic ones, do not arise as the result of mismanagement, ill will or the insufficiency for rationality in approaches, but arise for more fundamental reasons: they arise because we have constructed a deficient code for reading nature, leading to a deficiency in interacting with nature . *The root cause lies in the very foundations of our scientific world view: and in the very intellect which this world view engenders.*"<sup>4</sup>

Another important aspect of the problem, as referred to by many environmentalists, is the fact that, there is no a mass and intensive public support or awareness for dealing with environmental problems. When taken from a different perspective, the lack of the public support for environmental problems could be attributed to the dominant understanding of science; that is, people rely on the conviction that it is science and scientists that are expected to solve all problems by means of technology and technological achievements. Therefore,

<sup>1</sup>See White, Lynn "The Historical Roots of Our Ecological Crisis", in Jacson, W. & Wesleyan, K., eds., *Man and The Environment*, W.M. C. Brown Company Publishers, Dubuque, Iowa, 1971, 27.

<sup>2</sup>For different and critical views on the subject see, Passmore, John, *Man's Responsibility of Nature*, Duckworth, London, 1974; Santmire, H.Paul, "Historical Dimension of the American Crisis?" in Barbour, I.G., ed., *Western Man and Environmental Ethics*, London, 1973; Black, John, *The Domination of Nature*, Edinburgh, 1970, see especially second and third chapters.

<sup>3</sup>Ford, Glyn, "Rebirth of Islamic Science", in Ziauddin Serdar, ed., *The Touch of Midas Science, values and environment in Islam and West*, Manchester University Press, Manchester 1984, 26.

<sup>4</sup>Skolimowski, Henryk, *Eco-philosophy*, London, 1091, p. vii. (The italics are added.)

people were never aware of the fact that the current problems may be the consequences of scientific world view, which has dominated our thoughts and lives since the 17<sup>th</sup> century. In other words, it is modern science and its underlying philosophy of science that legitimated our domination and utilization of nature and natural resources as such. This is, I think, should be regarded as a natural phenomenon. For it was never predicted and imagined that in the course of time this scientific world-view would lead us to such a paradoxical situation. Moreover, some positivist philosophers and their counterparts in scientific community expected that more science and more technological developments will lead to an inevitable progress and prosperity in human life so that the world will be a paradise for human beings. Condorcet, for example, who was a very optimistic philosopher of the enlightenment project and had a deep and unshakable belief in the power of science and its positive influence in the shaping of both nature and human society, argued that

“Nature has set no term to the perfection for human faculties, the perfectibility of man is truly infinite; and... the progress of this perfectibility, from now on independent of any power that might wish to halt it, has no limit than the duration of the globe upon which nature has cast us”.<sup>5</sup>

Therefore, Condorcet’s views have been deemed as the most powerful statement of the new 18<sup>th</sup> century view of man and society. “It is one in which science is the instrument of progress towards a free, just society in which all men and women, equal in being distinguished from nature by their power of reason and the ability to manipulated nature, have equal claims on natural justice, rights and law.”<sup>6</sup> Although the scientific achievements and what it offers to us by means of technology cannot be denied, its unnatural treatment of nature, its attitude towards nature and what consequences it brought for us also cannot be neglected in this context. Therefore, it is necessary to discuss the role of science and scientific world view and point out, if it can be regarded as responsible for such an evil state of affairs.

I think it is useful to investigate the concept of science as such in this context and clarify what it means. For there are many recent philosophers of science, such as Popper, Lakatos, Toulmin, Hesse, Shapere, Feyerabend, Kuhn, Polanyi, who make a clear-cut distinction between science as such, and its positivistic interpretation, which is the dominant paradigm of modern times.<sup>7</sup> As a result, this new controversy over the concept of science brought into discussion all other concept and traditions of science in a postmodern world.

Thus, to answer the question whether science is responsible or not, is not an easy and simple task. For it requires to clarify what the concept of science means and rethink the presuppositions upon which positivistic concept of science was based. Furthermore, one should discuss what is meant by the positivistic concept of science and what its underlying philosophy regarding man-nature relationship is. Then it will be clear, even to some extent, that if there is only one tradition of science per se that can be taken as responsible for environmental crisis or there are still other traditions among which the positivistic tradition can be regarded as only one tradition.

However, it may still be asked why the study and understanding of science and scientific world view is so crucial in understanding and solving environmental problems. To answer this and related questions, we should not forget the fact that it is a prime channel (or ‘epistemology’ i.e., an approach to knowledge) by which we inform ourselves about our ‘real’ environment, animate and inanimate. In short, our modern world-view was constituted by science. For, “science furnishes us with both a method to study the environment, and a philosophy which tells us about our relations to the environment.”<sup>8</sup> As a result of this legitimization, in Western eyes, science is repository of truth. It is often the monolithic arbiter of what is and is not valid. The scientific “expert” is its high priest, and it is he who can tell us objectively what the difference between our ‘real’ and our perceived environment is. This popular notion derives ultimately from Francis Bacon’s view of the properties and

---

<sup>5</sup>de Condorcet, Marquis, *Sketch for a Historical Picture of the Progress of the Human Mind*, 1774, (Quoted in Pepper, David, *Roots of Modern Environmentalism*, Croom Helm London, 1984, 58).

<sup>6</sup>ibid., 59.

<sup>7</sup> In understanding what science is and how it develops, unlike earlier thinkers in the tradition of the philosophy of science, these new philosophers of science do historical research and rely both on it and on the observations of contemporary scientists in the process of developing their own theories and ideas. Kuhn, Thomas, *The Structure of Scientific Revolutions*, 2nd ed., University of Chicago Press, Chicago, 1970; Kuhn, Thomas, “Reflections on My Critics”, in *Criticism and Growth of Knowledge*, Lakatos Imre and Alan Musgrave, eds., Cambridge University Press, New York, 1970, 231-278. Feyerabend, Paul K., *Against Method*, New Left Book, London, 1975; Polanyi, Michael, *Personal Knowledge: Towards a Post-Critical Philosophy*, University of Chicago Press, Chicago, IL 1958; *The Tacit Dimension*, Doubleday & Co., Inc., Garden City, New York, 1967; Toulmin, Stephen, *The Return to Cosmology: Postmodern Science and the Theology of Nature*, University of California Press, Berkeley: 1982, 255-6. See also, Bernstein, Richard J., *Beyond Objectivism and Relativism: Science, Hermeneutics, and Praxis*, University of Pennsylvania Press, Philadelphia, 1983, 51-71.

<sup>8</sup> Pepper, supra note 5, 8.

characteristics of science and scientists.<sup>9</sup> According to David Pepper, it is this concept of science that informs, affects and determines our conception nature on three levels.

At the ideological level, science now provides a major element of our basic presuppositions about the world and man's relationship to it, and in coming to do so classical science has displaced alternative ways of understanding the world. It has displaced alternative bodies of natural knowledge, such as myth, folklore and natural magic. Secondly, in its theories science explicitly or implicitly embodies particular concepts of the man-nature relationship. Thirdly, in its practice or methodology it involves the scientists in particular methodological positions which describe especially the relationship between himself as subject- the observer of nature- and the object under observation. Thus in the process-in the very act -of gaining knowledge of nature, the scientist defines his relationship with nature in a particular way.<sup>10</sup>

It is the aim of this paper to point out that the positivistic concept of science is only one tradition among many. Feyerabend defines and classifies it as "First world science- one science among many".<sup>11</sup> So, if the ecocentrists are correct, claiming that science is responsible for environmental problems, I think it is the positivistic understanding of science and its underlying philosophy, not science as such. Therefore, many other traditions of science and their views about man-nature relationship and the way of getting knowledge have been studied by philosophers of science, and so, some classical and also modern views of nature are studied and re-discussed. If we want to find out a way dealing with and solving ecological problems, I think, it is an obligation for us to re-investigate and reexamine the modern scientific world view and the assumptions on which it has been based. In this respect, as Pepper points out, "the study of the history and philosophy of environmental ideas provides an invaluable perspective to those who attempting to find a way out of our predicament"<sup>12</sup> Moreover, Skolimowski goes further and claims that:

Philosophers thrive on challenges, for every new philosophy is a challenge par excellence thrown to the limits of our comprehension of the world. We are now in yet another period of ferment and turmoil, in which we have to challenge the limits of the analytical and empiricist comprehension of the world just as we must work out a new conceptual and philosophical framework in which a multitude of new social, ethical, ecological, and ontological problems can be accommodated. The need for a new philosophical framework is felt by nearly everybody.<sup>13</sup>

Thus, a critical discussion and evaluation of the dominant positivistic understanding of science and its relevance to environmental problems is necessary. In fact, after Kuhn's contribution to the philosophy of science such a discussion is inevitable.

## II. The Positivistic Interpretation of Science: Science as One Tradition Among Many

Now, let us look at the concept of science and rethink about what it means to us. For it is claimed for two or three centuries that the only possible science, or legitimate knowledge about nature and reality, is the scientific world-view which is also claimed to be objective, universal, and as a result, applicable to all domains of life. In other words, according to the scientific world view there is only one method which could give us true knowledge about reality. Although there are, of course, many different forms and schools of traditional science such as Egyptian, Indian and Chinese<sup>14</sup>, they are rejected as being unscientific, mythological, and subjective. The new positivistic understanding of science which is the dominant understanding of science in modern times can be summarized as follows:

---

<sup>9</sup> Ibid., For Bacon's philosophy of science and its relevance to the idea of domination of nature and as a result to environmental problems see, Leiss, William, *The Domination of Nature*, George Braziller, New York, 1972, 45-73: Leiss, William, "Utopia and Technology: Reflections on the Conquest of Nature", (1970) 22/4 *International Social Sciences Journal*, 580: Cranston, Maurice, "Francis Bacon" *The Encyclopedia of Philosophy*, Englewood Cliffs, NJ, 1967, 237.: Farrington, Benjamin, *Francis Bacon: Philosopher of Industrial Science*, , Haskell House Pub., Ltd., New York, 1973.: Merchant, Carolyn, *The Death of Nature: Women, Ecology and the Scientific Revolution*, , Harper and Row, San Francisco 1980.

<sup>10</sup> Pepper, supra note 5, 37-38.

<sup>11</sup> Feyerabend, Paul, Introduction to *Yönteme Hayır*, Turkish translation of *Against Method*, translated by Ahmet İnam, Ara yayıncılık, İstanbul, 1989, 9.

<sup>12</sup> Pepper, supra note5, 3.

<sup>13</sup> Skolimowski, supra note 4, 22-23.

<sup>14</sup> See, Nasr, Seyyed Hossein, "Islamic Science and Western Science Common Heritage, Diverse Destinies", (1987) 3/1 *MAAS J. Science* 11.

“The term "positivism" coined by Auguste Comte, in general is used as a name for a form of strict empiricism: the positivist maintains that only those knowledge claims which are founded directly on experience are genuine. Modern logical positivism, in particular the positivism of the Vienna Circle, is a form of positivism which accepts the symbolic logic of Principia Mathematica as its primary tool of analysis. For the logical positivist there are two forms of research which yield knowledge: empirical research, which is the task of the various sciences, and logical analysis of sciences which is the task of philosophy.”

“The central doctrine of logical positivism is the verification theory of meaning, the thesis that a contingent proposition is meaningful if and only if it can be empirically verified, i.e., if and only if there is an empirical method for deciding if it is true or false; if no such method exists it is a meaningless pseudo-proposition”.<sup>15</sup>

However, the recent studies and discussion in the philosophy of science argued that that the main claim of positivistic understanding of science is inadequate on the one hand and there are other traditions and methods with regard to gaining knowledge about reality on the other. Although positivists, both logical and empiricist, nearly persuaded all of us that there is only one method, recent developments underlines the fact that there are still more than one method of understanding and interpreting the reality. For example, Capra points out that “in trying to understand the mystery of life, men and women have followed many different approaches. Among them, there are the ways of the scientist and mystic, but there are many more; the ways of poets, children, clowns, shamans, etc.”<sup>16</sup> Capra once more emphasizes the fact that “these ways have resulted in different descriptions of the world, both verbal and non-verbal, which emphasize different aspects All are valid and useful in the context in which they arose. All of them, however, are only descriptions, or representation of reality and are therefore limited. None can give a complete picture of the world.”<sup>17</sup>

Feyerabend, on the other hand, regards the positivistic view of science, which was resulted from the scientific revolution in Europe, and that is “now practiced and taught at universities and technological institutes all over the world.” and also argues that “First-World science contains ideas that arose from particular historical conditions and therefore lacks universal validity.” Since this science, i.e., First-World science, “has showered us with ideas and technological achievements”,<sup>18</sup> all people relying on it and recouring it for their problems, I think, seems plausible to some extent. To change this view of science it was pointed out that it is only a product of a historical context, and as a result, influenced by the presuppositions and ideas of this historical context. Therefore, the dominant concept of science must be criticized and reevaluated in order to get a better holistic concept of science which would be more in accord with our present day ideas and considerations. Showing historical background of current science it will suffice to quote White’s argumentation:

“both modern technology and modern science are distinctly Occidental. Our technology has absorbed elements from all over the world, notably from China; yet everywhere today, whether in Japan or Nigeria, successful technology is Western. Our science is the heir to all *the sciences of the past*, especially perhaps to the work of the great Islamic scientists of the Middle Ages, who so often outdid the ancient Greeks in skill and perspicacity: al- Razi in medicine, for example; or Ibn al-Haytham in optics; or Omar Khayyam in mathematics . Indeed, not a few works of such geniuses seem to have vanished in the original Arabic and to survive only in medieval Latin translations that helped to lay the foundations for later Western developments. Today, around the globe, all significant science is Western in style and method, whatever the pigmentation or language of the scientists.”<sup>19</sup>

Thus, there were many tradition of science in the world since the appearance of man on the world. Max Scheler, however, uses the concept of positive sciences (Herrschaftswissen) in a different context. Positive sciences means for Scheler as “the development of various techniques for subjecting the environment to the ends

---

<sup>15</sup> Brown, Harold I., *Perception, Theory and Commitment. The New Philosophy of Science.*; The University of Chicago Press, Chicago and London, 1977, 21: For a good summary of recent debates leading to the general rejection of positivism as an adequate understanding of science, See Suppe, Frederick, "The Search for Philosophical Understanding of Scientific Theories," in Suppe, Frederick, ed., *The Structure of Scientific Theories*, University of Illinois Press, Urbana, 1977: and part two of Richard Bernstein's *Beyond Objectivism and Subjectivism: Science, Hermeneutics and Praxis.*; University of Pennsylvania Press, Philadelphia, 1983.

<sup>16</sup> Capra, *The Tao of Physics*, 294

<sup>17</sup> *ibid.*

<sup>18</sup> Feyerabend, *supra* note 11, 9.

<sup>19</sup> White, Lynn, "The Historical Roots of Our Ecological Crisis", in *Man and The Environment*., Jacson-K. Wesleyan W., eds., W.M. C. Brown Company Publishers, Dubuque, Iowa: 1971. A.N. Whitehead also supports White’s position on the roots of modern science in *Science and the Modern World*, Company, New York, The Macmillan, 1926, Chapter one; and Nasr, Seyyed Hossein, "Islamic Science and Western Science Common Heritage, Diverse Destines".

of man."<sup>20</sup> However, there is an important difference between Scheler's use of positive science and the positivistic understanding of science. While the modern positivistic philosophy of science rejects all other traditions and ways of understanding the reality, Scheler's concept of positive science develops and coexists with two other types of knowledge, namely metaphysics and religious thought. According to him "these are also historical constants, that in all stage of human civilization and in every developed culture. They do not follow each other as successive epoch in a scheme of linear historical progress, as Comte had argued."<sup>21</sup> Thus, for example, in the Aristotelian system, "the positive sciences are established as parts of an overall metaphysical world view; and similarly in other cultures characterized by a low level of mastery over natural environment, intellectual life is governed by philosophical and religious systems which devalue the concerns of mundane life."<sup>22</sup> This can be seen very clearly in the development of Islamic science, which is developed within the overall Islamic world-view.<sup>23</sup>

However, with the seventieth century everything has changed. In the course of time, the scientific worldview replaced all previous tradition of science and then rejected them as being unscientific. Within this new paradigm the possibility of metaphysics is also rejected and any claims of knowledge that is based on metaphysical presuppositions were regarded to be illegitimate and meaningless.<sup>24</sup> W. Leiss underlines the importance of this change as follows.

"This change represents the liberation of the positive sciences from the tutelage of metaphysics and the establishment of a foundation for a set of techniques capable of rendering nature more subservient to human purposes. The new science views itself as freeing the investigation of nature from all 'metaphysical' and 'religious' assumptions and dogmatism. The historical result of its efforts in this regard is a novel conception of science: scientific knowledge is a type of understanding which stands apart from all value-judgment and value-determination, and the objects of scientific knowledge are themselves necessarily value-free".<sup>25</sup>

Nasr also underlines this new aspect of this science with these words:

"A new science was indeed born, one which discovered much in the realm of quantity, but at the expense of forgetting the traditional world view and neglecting the spiritual dimension of nature- a forgetfulness with dire consequences whose extremely bitter fruits are only being fully tasted."<sup>26</sup>

Scheler also discussed the value-free claim of modern science. According to him "to conceive the world as value-free" is the key of understanding what modern science is: "To conceive the world as value-free is a task which men set themselves on account of a value: the vital value of mastery and power over things."<sup>27</sup> It is interesting to observe the fact that, while modern scientific and positivistic world view denies and rejects all value claims as being meaningless and emotive on the one hand, and to claim itself as being value-free, and therefore objective and universal, on the other. The only value for positivistic understanding is that of utility that is viewing the world as consisting entirely of matter potentially transformable for purposes of human use and

---

<sup>20</sup> Leiss, William, *The Domination of Nature*,: George Braziller, New York 1972, 106.

<sup>21</sup> *ibid.*, 106

<sup>22</sup> *ibid.*, 108

<sup>23</sup> A good example of how Islamic world view and value system influence man and scientists attitude can be seen in the following remarks of Nasr: The contemplative who is of a gnostic nature is the channel of grace for nature. He hears the invocation of nature in the solitude of high mountains and deserts, along shore of the sea and in the heart of forests. He prays with nature and acts as her protector and interm diary vis-à-vis the Divine Presence." Nasr, Seyyed Hossein Nasr, "Islamic Science and Western Science Common Heritage, Diverse Destinies", p. 18. The impact of the Quran can be observed in this attitude. Just to quote one verse Quran says that "The seven heavens and the earth and all that is therein praise Him, and there is not such a thing but hymenth his praise; but ye understand not their praise." 17:44. In addition, according to Islam nature with all its components is created by God and that all living things were created with different functions which are carefully measured and meticulously balanced by the Almighty Creator. And man, according to Islam, is not regarded as the master of nature but just a part, a very important part, of nature. He was regarded as the vicegerent of God on the earth. A Muslim, therefore, " has a very special relationship with those worlds which in modern times have come to be known as the environment. Indeed, that these worlds exist and they were made by the same Creator means that they are united and independent, each a part of the perfect system of creation.." See, Mawil Y. Izz Deen (Samarrai), "Islamic environmental ethics, law, and society", in J. Ronald Engel and Joan Gibb Engel, eds., *Ethics of Environment and Development*,: Belhaven Press, London, 1990, 195.

<sup>24</sup> See, for example, Alferd Jules Ayer, *Language, Truth and Logic*,: Dover, New York 1946; Brown, Harold, *Perception, Theory and Commitment*, Part One.

<sup>25</sup> Leiss, supra note 20, 109-110.

<sup>26</sup> Nasr, supra note 23, 13,

<sup>27</sup> Leiss, supra note 20, 110.

benefit. Nasr underlines this aspect of modern science with these words: The goal of science in minds of many, if not all its practitioners, has become the control and manipulation of nature and not its contemplation".<sup>28</sup>

Pointing out that the current concept of science as being only one tradition of science does not mean, however, to ignore or reject it as a whole. On the contrary, our aim is to point out its short comings on the one hand and its inadequacy of solving our current problems on the other. Then, to criticize some of its fundamental presuppositions which are, of course, products of a historical context. For they are these presuppositions, I think, which yielded such alienation of man and made a gap between man and nature which in the long run resulted the exploitation of nature and domination of nature by man. In other words, "science in the West became wed to the quest for power, control and to large extent wealth, and the utility of science became confined to the welfare of man seen as a purely earthly creature with no needs beyond those of an animal with certain mental powers."<sup>29</sup> Man never considered himself being a part of nature and if the balance of nature changed it would also influence his very being as part of it. These presuppositions made man as being center for everything and emancipated him from all values and, furthermore, man himself laid down his own values, namely what is necessary and suitable for his interests, so that he never feels himself as responsible for what going on, namely the process of devastating of nature.

So, when we look at the birth and the development of modern science we see that it was preceded and accompanied by development of some philosophical thoughts. In other words, it was based upon some philosophical presuppositions, about man and nature. However, the metaphysical implications of Cartesian philosophy and the Newtonian mathmatico-mechanical understanding of nature will be discussed here. However, let us summarise the previous world-view, i.e., the Medieval, and Renaissance world-views.

## A. The Medieval Concept of the World

When we look at the medieval world-view we see that the hallmark of medieval thought is its dependence on a transcendental being, viz., God. So, man's conception of himself and the world was construed by divine authority. In other words, man began to conceptualize his place in the universe and the meaning of universe within a religious context, with the belief that all being was created by God, the Almighty. Also according to this religious doctrine, man was created by God as a being different from all others, in fact as the vicegerent of God. Therefore the early medieval Christians accepted, almost without hesitation, the view inherited from Jewish writings that *God had given humans the right to exploit plants, animals and the whole world for their benefit*. Nature is not seen as sacred and therefore it is open to exploitation by humans without any moral qualms- indeed humans have the right to use it in whatever way they think best."<sup>30</sup>

This last sentence summarizes the medieval attitude towards nature and the natural world as such. For it provided a ground and framework which led people to conclude that "people are somehow separate from and above animals and other things in nature and that people were placed on earth by God to regulate and to bring order to the earth."<sup>31</sup>

As it is seen, even though nature is also created by God according to Christianity, there is a clear cut distinction and separation between nature and man. While man is praised and given every right, the nature is seen as "the bad world" outside the Garden of Eden. From the time of their expulsion of them in to this world people had "the religious duty to control and tame the wilderness" into which Adam and Eve had been thrust:

In early and Medieval Christianity, wilderness kept its significance as the earthly realm of the powers, of evil that the Church had to overcome... Christians judged their work to be successful when they cleaned away the wild forests and cut down the sacred groves where the pagans held their rites.<sup>32</sup>

---

<sup>28</sup> Nasr, supra note 23, 17.

<sup>29</sup> *ibid.*, However, in direct contrast to Islamic world view, according to Nasr, where science was always related to wisdom and even its utility was envisaged in the light of man's need as an immortal being", 17

<sup>30</sup> Dönting, *A Green History of the World*, 144. (The italics are added).

<sup>31</sup> Altman, *infra* note 32, 19.

<sup>32</sup> Roderick Nash, *Wilderness and the American Mind*, (New Haven: Yale University Press, 1967, p. 17); Also for the Medieval view of natural world see, Altman, *Culture and Environment*, 1; Burt, E. A., *The Metaphysical Foundations of Modern Science*; White Lynn, "The Historical Roots of Our Ecological Crisis"; Passmore, John, *Man's Responsibility for Nature*; J. Hughes, Donald, *Ecology in Ancient Civilizations*,: University of New Mexico Press, Albuquerque, 1975;

The result of the Medieval world view, in relation of nature and non-humans, can be summarized as follows:

Man's authority over natural world was thus virtually unlimited. He might use it as he pleased, "for profit or for pleasure". Vegetables obviously had no rights, for they were destitute of sense and therefore incapable of injury. Animals had no rights either.<sup>33</sup>

## B. The Renaissance Concept of the World

When we look at the Renaissance concept of the world, which is considered to be the second great cosmological movement of the sixteenth and seventeenth centuries, we see that it also regarded nature as a living organism. The main features of this cosmology were a hostility to Aristotle's concept of nature and then a rejection of teleology in nature. It insisted on the immanence in nature of formal and efficient causes, that is the natural world was conceived as a living organism, whose immanent energies and forces were vital and physical in character.<sup>34</sup> The four elements (earth, air, fire and water) that made up the material world below the moon, and the fifth element (ether) that made the stars and planets were material bodies. The soul was the source of its animate daily motion as the sun, stars, and planets encircled the geocentric earth every twenty-four hours. The spirit, descending from God in the heavens beyond, mingled with the ether and the ambient air, to be imbibed by plants, and humans on the earth's surface. The living character of the living world organism meant not only that the stars and planets were alive, but that the earth too was pervaded by a force giving life and motion to beings on it.<sup>35</sup> And this organic and living concept of the natural world had some implications for human actions. In fact, it implied a restrictive function on human attitudes towards nature. For, as Merchant points out eloquently, "one does not readily slay a mother, dig into her entrails for gold, or mutilate her body." And she concludes that "as long as the earth was conceptualized as alive and sensitive, it could be considered a breach of human ethical behavior to carry destructive acts against it."<sup>36</sup>

Collingwood emphasizes the ethical implications of the Renaissance cosmology for man in the following words:

This immanence lent a new dignity to the natural world itself. From the early history of the movement it led people to think of nature as self-creative and in that sense divine, and therefore induced them to look at natural phenomena with respectful, attentive and observant eye; that is to say, it led to a habit of detailed and accurate observation, based on the postulate that everything in nature, however minute and apparently accidental, is permitted by rationality and therefore significant and valuable.<sup>37</sup>

## C. Modern Scientific Concept of the World

The Medieval and the Renaissance world views, with their overall metaphysical systems and ethical implications, began to change thoroughly at the beginning of the seventeenth century and afterwards by the modern scientific world view. This new world-view looked upon nature as a machine. Thus, the organic cosmology that was experienced in some form by most cultures throughout history was abandoned.<sup>38</sup>

This mechanistic view assumes that nature can be divided into parts and that these parts can be rearranged to create other species of being. The main feature of this new world-view is a dualistic conception of reality, namely the distinction between mind and matter. The mechanistic world-view constructs the world as a

---

Ittelson, W.H., *An Introduction to Environmental Psychology*, New York: 1974, especially chapter two "Historical Attitudes Toward The Natural Environment", pp. 17-58; Hargrove, E., *Foundation of Environmental Ethics*.

<sup>33</sup>Thomas Keith, *Man and The Natural World*, Allen Lane, 1983, London, p. 21. Although the Islamic world view has some main characteristics of medieval world view, such as accepting the existence as the basis of all reality, with regard to man-nature relationship and man's place and meaning of the world it differs both from Judaism and Christianity. See, Seyyed Hossein Nasr, "Islamic Science and Western Science Common Heritage, Diverse Destinies"; Mawil Y. Izzi Deen (Samarrai), "Islamic environmental ethics, law, and society".

<sup>34</sup>Collingwood, *The Idea of Nature*, 94-95.

<sup>35</sup>Merchant, *supra note 9*, 42.

<sup>36</sup>*ibid.*, 43; also see Collingwood, *The Idea of Nature*, pp. 93-100.

<sup>37</sup>*ibid.*, 95.

<sup>38</sup>See, Merchant, *The Death of Nature*, 1-6; *supra note 9*, 42-44.

vast machine made up of interchangeable atomic parts manipulable from outside, just as the parts of individual machines can be replaced or repaired by human operators. So, once nature is seen as *nothing but a grand machine*, it is a small step to the view that only considerations of efficiency apply to our actions on nature, and that there are no moral limits imposed upon science and technology *by virtue of the nature of their subject matter*.<sup>39</sup> And this new mechanistic world-view of the seventeenth century replaced the Renaissance world view of nature as a living organism with a nurturing earth at its center. The emergence of the mechanical or mechanistic conception of the world, therefore, is regarded as one of the numerous modifications that scientific thought about nature has undergone in the course of centuries.<sup>40</sup>

While the body is interpreted as preordained lifeless nature (*res extensa*), the mind is taken as the very act of thinking (*res cogitans*) and man is referred to as a knowing subject by the Cartesian philosophy. This new metaphysics claimed that the natural world, as a lifeless object, is completely different from the knowing subject. Nature was conceived as a huge machine and therefore, is knowable and understandable by man. According to this new understanding of nature, “facts” or informative items can be extracted from the environmental context and rearranged according to a set of rules based on logical and mathematical operations.<sup>41</sup> The task of mind, that is knowing subject, is to observe, and then formulate these external relations and facts in order to control and dominate them for the benefit of humans. What is important here is the implicit conviction that the activity of mind never disturbs or essentially changes the mechanism of the natural world in the process of knowing and using it. However, the result of this new concept of science summarized by Nasr as follows:

West was rapidly developing a science based on considering nature as a ‘thing’ or an ‘it’ to be quantitatively studied, conquered, controlled, manipulated and finally despite the opposition of many scientist, raped with such ferocity that results now threaten human existence itself.<sup>42</sup>

As a result, in the middle of the seventeenth century Cartesian philosophy triumphantly altered all previous world views from the ancient cultures of East and West that considered the earth as active and alive. It is not surprising to hear that an eminent philosopher of the enlightenment, d’Alembert, considered the study of nature “in itself to be cold and dull”.<sup>43</sup>

Thus, the influence of Cartesian philosophy is evident in the making of modern science. The Cartesian philosophy argued that *Nature is distinct from us and nature is composed of matter* as such, which is here for man’s use, man’s use does not change the essence of phenomena which is dead, inert and insensitive, and there is no intrinsic value in nature. For *nature is lifeless and valueless* on the one hand, and all values are regarded as subjective and relative on the other. This is how the emergence of environmental problems gives us the opportunity to look back on the foundations of this revolution and discover its relevance to our present situation and dilemma

However, the contemporary concept of nature has changed and it is no longer seen as a mechanism but, rather a process characterized by constant and largely irreversible changes.<sup>44</sup> A saying of environmentalist groups reflects this new concept of nature very well: “*You cannot do just one thing.*” It is argued, therefore, that to understand the real dimensions of our attitude towards nature, we are obliged to understand the process of formation and legitimization of our attitudes towards the world.

Thus, “from the principles of secular sciences, to the foundations of religious revelation, from metaphysics to matters of taste, from music to morals, from the scholastic disputes of theologians to matters of trade, from the laws of princes to those of peoples, from natural world to the arbitrary laws of nations...

---

<sup>39</sup>ibid., p. 294.

<sup>40</sup>Dijksterhuis, E.J., *The Mechanization of the World Picture*,: Oxford University Press, London, 1961, 3.

<sup>41</sup>Merchant, *supra note* 9, 45-60.

<sup>42</sup> Nasr, *supra note* 26, 13.

<sup>43</sup> Ernst Cassirer, *The Philosophy of Enlightenment*, trans. by F.C.A. Koellen and J.P. Pettegrove. Princeton University Press, 1951, 3-4. For a good discussion of the development of the modern image of nature from rather a different perspective, and especially for the use and connotations of the terms “mechanical”, “mechanistic”, and “mechanism” see Dijksterhuis E.J., *The Mechanization of the World Picture*, 3.

<sup>44</sup>According to Capra, “the basic ideas underlying Newtonian physics, though insufficient to explain all natural phenomena, were still believed to be correct. The first three decades of our century changed this situation radically. The developments in physics, culminating in relativity theory and in quantum theory, shattered all the principal concepts of the Cartesian world view and Newtonian mechanics. The notion of absolute space and time, the elementary solid particles, the fundamental material substance, the strictly causal nature of physical phenomena, and the objective description of nature—none of these concepts could be extended to the new domains into which physics was now penetrating.” *The Turning Point*, 74.

everything has been discussed and analyzed.”<sup>45</sup> Thus, in the process of legitimization of man’s attitude toward nature, knowledge, both about himself and natural world, occupies a central place. The category of this knowledge may be traditional, mystical, religious or scientific. What is important in this context, I think, is that knowledge as such provides man with necessary motivation to conduct his attitudes towards nature.

Thus, when we look at the foundations of modern science and the way it looks at nature as such, we see this dualistic concept of modern philosophy. It is a result of this outlook and scientific world view that man began to treat his environment in an unnatural way. Nasr regards this approach of Western thought toward nature as absolutisation of earthly man over nature and points out its consequences as “it as this purely earthly man defined by rationalism and humanism who developed the 17<sup>th</sup> century science based upon the domination and conquest of nature, who sees nature as his enemy and who continues to rape and destroy the natural environment always in the name of the rights of man which of man which are seen by him to be absolute”.<sup>46</sup>

Hannah Arendt rightfully and emphatically stressed this dualistic aspect of Cartesian philosophy and its dreadful consequences for the modern age:

Descartes’ philosophy is haunted by two nightmares which in a sense became the nightmares of the whole modern age, not because this age was so deeply influenced by Cartesian philosophy, but because their emergence was almost inescapable once the true implications of the modern world view were understood. These nightmares are very simple and very well known. In the one, reality, the reality of the world as well as of human life, is doubted... The other concerned... the impossibility for man to trust his senses and his reason.<sup>47</sup>

One of the more important aspects of this new philosophy was its emphasize upon man and man’s place in the whole system. In other words, man is situated and placed at the center and foundation of the system. Man is considered as the measure of everything. Everything is defined, grounded, classified and valued just by man and from *an anthropocentric view*. This modern view about man’s identity “enabled man to master and use his natural environment and achieve his ends most effectively”.<sup>48</sup> Even the idea of existence of God is grounded in man’s existence. Since, it is this subject (the thinking self) which grounded and then proved the existence of God. Thus, the existence of self, the thinking “I”, precedes the existence of God in that the latter is proved to be existent just on the basis of the former. Zimmerman emphasizes this aspect of Cartesian dualism for Westerners as follows:

Everything revolves around, is determined and evaluated by, man as Subject. Thus Western man assumes divine prerogatives: He tries to make himself God. Man no longer needs revelation to ground truth; he has the power to gain absolute truth on his own, The world now presents itself to man in a new way. Instead of as a realm of beings ordered in great chain and sustained in their presence (Being) by the absolute presence o God, the universe now is revealed as a mathematically-quantifiable field of energy present as an object for the Subject. Thus Descartes asserted that man can and should become “master and possessor of nature”.<sup>49</sup>

It is not our intention, however, to blame Descartes and the Cartesian philosophy for all subsequent evils done to the environment. What we are trying to do is to elicit the ideas which may be regarded as the foundation and roots of our present ideas and attitude towards nature. Unless, the roots and origins of our present attitude are defined and clarified, it will be nearly impossible to develop a framework for a new one to replace it. So, let us look at the Cartesian self/I, that is the knowing subject, more closely.

---

<sup>45</sup> Cassirer, *The Philosophy of Enlightenment*, p.4.

<sup>46</sup> S.H. Nasr, "Islam and the Environmental Crisis", (1990) 4/3 *Journal of Islamic Research*, 163.

<sup>47</sup> Hannah Arendt, *The Human Condition* University of Chicago. Press, Chicago 1973, 277. Jacob Needleman also criticizes what he calls “the breakdown of the Cartesian-Enlightenment dream”, legitimizes the domination of nature and tries to ground it within a wider context, that is within the Western civilisations:

“Western civilisation as a whole now finds itself between dreams... [much as during the Renaissance when] Western man found himself between two dreams: behind him the dream of a Christianized world, before him the dream of *the conquest of nature*... the crises of ecology, the threat of atomic war, and the disruption of the patterns of human life by advanced technology... [have resulted in the fact that] the lullaby of scientific progress, the dream of manipulating nature to suit our egoistic purposes, is ended.” *A Sense of the Cosmos: The Encounter of Modern Science and Ancient Truth*, New York: Doubleday, 1975, pp. 1-3, quoted in George Session, Spinoza and Jeffers on Man and Nature, 20/4 *Inquiry* 492.

<sup>48</sup>Hartmut Rosa, “Goods and Life-Forms, Relativism in Charles Taylor’s Political Philosophy,” (May/June 1995), 21 *Radical Philosophy*, 21.

<sup>49</sup>Zimmerman, Michael, "Heideger and Marcuse: Technology as Ideology", in 2 *Research in Philosophy and Technology*, JAI Press., 1974, 248.

As the human self is regarded as the indubitable foundation of our being, it is natural to ground everything upon it. As we have just pointed out, even the existence of God, is grounded on the concept of *self*. Meanwhile, the reality of the natural world is determined by the subject and is denominated as object. The object and subject are distinct from and independent of each other. Descartes argued that “there is nothing included in the concept of body that belongs to the mind; and nothing in that of mind that belongs to the body.”<sup>50</sup> And according to Capra, the Cartesian dualism’s division between mind and matter has had a profound effect on Western thought. It has taught us to be aware of ourselves as isolated egos existing inside our bodies; it has led us to set a higher value on mental than manual work.<sup>51</sup> “The reality of the real (or the Being of beings) now stands revealed as the presence for the Subject: to be is to be present according to the dictates of the self-certain-Subject. Now the entire cosmos is disclosed as a kind of “picture” or “image” or “object” for the human Subject.<sup>52</sup> So, everything that is outside and around man is determined and evaluated by the Subject, as such. Thus, Western man assumes divine prerogatives: he tries to make himself God. Man no longer needs revelation to ground truth; he has the power to gain absolute truth on his own”<sup>53</sup>

We may summarize some assumptions of the Cartesian philosophy as follows: *The first* point made is that of dualism, that is man is composed of two substances, namely mind and body. Each is distinct and independent of the other. *The second* concerns the primacy given to mind, namely to the subject. *The third* point is that body or matter is regarded as dead and material, whose main attribute is *res extensa*, while the mind’s main attribute is *thinking*. *The fourth* is that man, i.e., the Subject, has the right to change and use the natural world as he wishes. *The fifth*, man’s using the natural world resources efficiently and in large quantities will finally lead him to prosperity and happiness. *The sixth*, this material nature is infinite and does not finish at any given time.

Today, however, all these exalted presuppositions and assumptions of modernity have come under criticism and have been challenged on the charge that they underlie the present prevalent ideas that led to our present set of attitudes and shaped them in the course of history.<sup>54</sup>

With Newton, however, all these preceding world views underwent a complete change, and as a result modern physics emerged as a new discipline which arranged and legitimated not only man’s understanding of nature but also modern man’s whole life and scientific endeavor. According to Burt, since the seventeenth century a two-fold importance has generally been ascribed to Newton: (1) he has profoundly affected the thinking of the average intelligent man by his outstanding scientific exploits, of which the most striking was his conquest of the heavens in the name of human science by identifying terrestrial gravitation with the centripetal movements of the celestial bodies(...), the discovery of the laws of motion and the law of universal gravitation, representing an incomparable, uniquely important victory of mind, which it could fall to the lot of only one man throughout all time to realize-and Newton had been that man; and (2) Newton was the man who took vague terms like force and mass and gave them a precise meaning as quantitative continuum, so that by their use the major phenomena of physics became amenable to mathematical treatment.<sup>55</sup> “It is because of these remarkable scientific performances,” Burt adds, “that the history of mathematics and mechanics for a hundred years subsequent to Newton, appears primarily as a period devoted to the assimilation of his work and the application of his laws to more varied types of phenomena.”<sup>56</sup>

Newton’s description of matter as *movable* is an ultimate break with all the traditional descriptions and definitions of nature. When he defines matter as movable it means that it does not possess an inherent or organic activity whereby it is able to move itself, as is the case in Aristotle’s *forms* or in the Renaissance’s *natura naturans*. What is important and new is that matter is essentially changeless in itself; the only change of which is capable of being locomotion, i.e. being moved from one place to another. The new physics, i.e. study of nature in of the modern period was, thus, not a study of the internal nature of the physical existents. For, according to this new conception of matter, matter was without potentiality for change, qualitatively or

---

<sup>50</sup>Quoted in Capra, *The Turning Point*, p.59

<sup>51</sup>ibid., 59.

<sup>52</sup>Zimmerman, supra note 49, 248.

<sup>53</sup>ibid,

<sup>54</sup>See, Blumenberg, Hans, *The Legitimacy of the Modern Age*, trans. Robert M. Wallace, MIT Press, Massachusetts 1983, 377-378.

<sup>55</sup> Burt, supra note 32, 31-32;

<sup>56</sup> ibid.

quantitatively, i.e. to grow or develop in any way- matter is just matter, everywhere and always the same- therefore there is nothing to study in matter *per se*.<sup>57</sup>

It seems, however, that Newton's mathematical understanding and explanation of the world Newton was based on a dualism, i.e., the passivity of matter and the externality of force. This understanding eliminated from the description of the nature, the concepts of spatial hierarchy, value, purpose, harmony, quality, and form, all of which were central to the older organic description of nature. It is mainly this materialistic understanding of nature - as a value free relationship established between man and nature - that has shaped the attitude of man towards nature. As a result of this understanding, nature has a merely instrumental value with regard to modern man. In other words, nature's value is measured by means of its usefulness and by how much it provides man with his needs. In short, there is no any inherent and intrinsic value in nature. And this understanding implies that there is no responsibility, in ethical terms, towards nature. As a result of this new understanding "any spiritual view of nature was relegated to the category of 'nature mysticism' while what remained of the traditional sciences of nature in the West became reduced to the category of the occult or even superstition."<sup>58</sup>

Thus, it is time to rethink and reevaluate the foundations of our ideas about ourselves and nature on the one hand, and the way we deal with nature on the other. Then as a result of this awareness to improve a more adequate and humanly concept of science and as well as man-nature relationship.

### III. Conclusion

If, in spite of the optimistic view of positivistic concept of science, there is a worldwide environmental crisis confronting us, so there must be something wrong with our concept of science. In other words, if science and technology have been regarded as among the causes of environmental problems by some thinkers, so, we have to look at our concept of science and see if there are some misconceptions about man-nature relationship which may need revision and refinement. For the dominant concept of science, or analytical tradition of science, (you may call it as logical atomism, or positivism, or empiricism) is a product of epoch, as a result, reflects ideas and thoughts of this epoch, as mentioned above. Feyerabend points out that "it is [the modern concept of science] one of the many forms of thought that have been developed by man, and not necessarily the best"<sup>59</sup> So, we always have the opportunity that we may put them aside and develop a better one which may reflect and represent the underlying ideas of our epoch. Therefore, it is up to us to criticize the underlying philosophy of modern science and its presuppositions, and then a better, a richer and a holistic concept of science may be developed. The ecological crises of modern world which is confronting and threatening us gives a chance to see the shortcomings of modern positivistic conception of science as the only channel and tool of truth about reality and its deficiencies.

All these requires a new concept of science. Although there are some other elements in relation of anti-environmental values,<sup>60</sup> the major role given to positivistic philosophy and its concept of science. The main reason for this account given by Skolimowski as follows.

"empirically oriented positivist philosophy, particularly developed in the Anglo- Saxon countries, provides the philosophical justification for the ruthless, exploitative, mechanistic paradigm which has wreaked so much havoc on world ecology, on Third-World nations and on individuals who have attempted to mold their lives in the image of the machine".<sup>61</sup>

Thus, once more we have to point out that it is this concept of science and its underlying world view which is criticized and pointed out that is the product of a historical context and, therefore, cannot be held as unchangeable and immutable. Moreover, in order to maintain science as such from the critics and unreliability we have to develop a new concept which may be much broader, richer and lively than the former. The attempt to

---

<sup>57</sup>Leclerc, Ivor, "Alfred North Whitehead: His Philosophy," in Gazo, E. W., ed., *Process in Context Essays in Post-Whiteheadian Perspectives*, Peter Lang, New York, 1988, 27-28.

<sup>58</sup> Nasr, supra note 23, 18.

<sup>59</sup> Feyerabend, supra note 7, 295.

<sup>60</sup> Schumacher, on the other hand, distills all the anti-environmental values into six main ideas and according to him these ideas still dominate the minds of educated people today. These were: "evolution; competition, natural selection and the survival of the fittest; the Marxist belief in the materialist base of history; the Freudian emphasis on the overriding importance of subconscious mind; the ideas of relativism, denying all absolutes, dissolving all norms and standards; the philosophy that 'valid knowledge can be attained only through the methods of the natural sciences'.

<sup>61</sup> Skolimowsky, supra note 4, 27.

develop a new and a holistic concept of science regarded as “our only chance to achieve a humanity we are capable of, but have never fully realized.”<sup>62</sup>

The havoc wrought by modern science has made many a thinking person to pause and to ask about the wisdom of accepting modern science as the only possible science of nature and to seek for the first time in the West since the rise of modern science to understand previously the significance and the world-view of the traditional sciences<sup>63</sup>

The organic concept of nature, I think, may give us this chance, in order to develop and construct a new concept of science which is more broader and richer than the modern one by means of regarding universe as a whole and in holistic way. The recent studies in contemporary physics as well as other disciplines give us the opportunity of developing such a concept.<sup>64</sup> In this respect, Whitehead regarded as “the first to realize fully that the contemporary scientific developments involved an abandonment of the classical modern scheme of fundamental ideas and basic conception of nature of things”<sup>65</sup> Nasr also underlines the need for a new concept of science which is the heir of the traditional sciences of the world.

To know nature in her intimate reality and according to the norms of the traditional sciences of nature is to gain a knowledge which is permanent, which satisfies the mind while nourishing the soul. It is also to gain a knowledge which no form of quantitative science can replace, a knowledge without which man cannot ultimately survive on earth but with the aid of which he can live in harmony with himself and with nature because he lives in harmony with that reality which is the origin of both himself and the natural order.<sup>66</sup>

To sum up, once again philosophy is confronted with a burden of responsibility: To work out and develop a new concept of science and a new world view which is more sensitive to the balance of our planet, and which takes into consideration all other traditional sciences and experiences of humanity in the course of history, namely other tradition of science, religions, and their messages about the meaning of nature. In the words of a leading philosopher of science "If we want to understand nature, if we want to master our physical surroundings, then we must use all ideas, all methods, and not just a small selection of them".<sup>67</sup>

This is a task nobody can escape from and become indifferent to it. Skolimowski also argues that " we have a great deal to learn from oriental cultures, from the history of our own civilization, and from primitive societies alive today, in understanding, acquiring and maintaining this state of mind in which 'thinking well is a pre-condition of behaving well". He concludes that "above all, we have to restore the unity of knowledge and values; we have to realize that wisdom or 'enlightened knowledge' is the key to human meaning. We also have to develop a new comprehensive philosophy which will make a new sense of the world around us."<sup>68</sup>. Thus, the meaning and value of science and its claims as the only legitimate way of knowing reality and all related issues have been investigated and re-constructed within a postmodern world.

---

<sup>62</sup> Feyerabend, supra note 7, 295.

<sup>63</sup> Nasr, supra note 23, 19.

<sup>64</sup> See, Capra, supra note 44: especially Leclerc, supra note 57, 26-43.

<sup>65</sup> Leclerc, supra note 57, 26.

<sup>66</sup> Nasr, supra note 23, 19.

<sup>67</sup> Feyerabend, supra note 7, 306.

<sup>68</sup> Skolimowski, supra note 4, 18-19.