CHAPTER 1

INTRODUCTION

Mankind has been, from ages immemorial, in search of ways to help itself acquire all possible knowledge. This search may be called the study of the teaching-learning process or education. It has been undertaken for two reasons. One reason is that the quest for knowledge is inborn and innate in man. The other reason is that, knowledge helps man in his well-being.

Historical study of nature, natural history shows this quest for knowledge, as a trait which is shared by man with the other living beings in nature. Natural history also shows that there is an inner urge, towards perfection in nature. This inner urge is also found in man and makes him strive for his well-being.

The thirst for knowledge cannot be quenched easily, because, it involves knowledge of the whole universe, the complete historical process of nature. Unless man learns, about the whole historical process of nature, man will not possess the necessary knowledge to achieve his well-being. It is so because, man is one with nature, and A. N. Whitehead says,

It is false dichotomy to think of Nature and Man.
Mankind is that factor in Nature which exhibits in its most intense form the plasticity of Nature.¹

Accordingly, to know man in all his dimensions, is to know man in all his relationships with nature.

The study of nature, in its historical perspective, may be called as nature-philosophy, and nature-philosophy is gained with the help of natural sciences and social sciences. Nature-philosophy seeks the help of modern sciences, because modern sciences have, progressed beyond the empirical attitude and tend to become philosophical.²

The vast studies taken up in natural sciences and social sciences take man more as a living entity of nature, possessing mainly, biological, social and aesthetic dimensions. He is a living being whose existence is characterised by social phenomena and aesthetic sense. Accordingly, he has to be educated to know himself in his true perspectives and to shape his life on these.

On the contrary to the above truth, existing system of education fails to impart the necessary knowledge, to help man evolve a better way of life. It takes him away from the


world of living beings and treats him in isolation from the rest of the universe. This separation of man, from the rest of the universe, nature, depicts a false picture of human existence, which makes man to view every other entity as an opposition and threat to his own self. This fear leads to selfish tendency, which gives rise to a series of contradictions as competition, greed and hatred in the society.

A society riddled with contradictions cannot progress, and to solve these contradictions, mankind has to evolve a system of education based on a thorough inquiry about the historical process of nature. But the universe is a very vast and complex realm, and as such, it thwarts the human attempt to inquire about it and in the resulting failure, man threads his own downfall.

Anything, short of a thorough inquiry of nature, would only lead to partial knowledge of man and an education system based on such incomplete knowledge of man cannot help man to bring about complete development and progress. Instead, such a system of education, eventuates a social order full of inadequacies, that cause suffering and misery to mankind.

One such cause is the ignorance of the fact that there is a mutual relationship between man and nature. For exam-
ple, if mankind is to reap the benefits of soil fertility and rainfall, mankind must ensure, proper recycling and maintenance of soil fertility and rainfall by proper environmental planning and practice. Man can only enhance natural resources for his well-being, and cannot think of himself at the cost of natural resources. For instance, if man cuts down trees recklessly, it leads to soil-erosion and loss of rainfall which ultimately leads to human suffering.

One other such cause is the ignorance of the truth that there is a mutual relationship between man and man. This mutual relationship between man and man becomes clear from the fact, that it is only through understanding man as man and through co-operation and harmony, that mankind has shown progress and prosperity. As co-operation provides ample room for individuality in society, it fosters mutual trust and lets man to realize compassion and goodwill.

The present system of education is a failure, because, it is the outcome of short-sighted inquiry, which takes certain particulars in isolation, as ends in themselves and considers the knowledge of each particular, as complete knowledge. In this system one misses the wood for the tree. But, philosophy says, 'each actual entity is a throb of experience including the whole universe.'

\(^3\) Every finding,

slates man, in his attempt to inquire, and in that over-enthusiasm he overlooks the limitations of his partial inquiry and tries to build his whole life on it, and meets with disaster.

One such finding is the present day man's super-technology that threatens him with various health hazards and nuclear holocaust. This technological know-how has made man an alienated being in the very world of his living. He is reduced to more or less a mechanical entity, losing fast his natural vitality to live as a healthy being, both in body and in mind. One condition which aggravates this downfall is lack of co-ordination between various inquirers. Hence, all the studies are to be properly co-ordinated and applied towards overall development of man, and this is achieved by education.

To put forth precisely, the existing system of education acts as an instrument to set man against man and nature, to bring in competition and greed. It also tries to mould man, as though they were entities with no essences, to fit into a serial order. This mechanization of humanity and reduction of men to tools to subserve other ends as, political ends, technological ends, economical ends and religious ends constitute the basis for all the hardships of mankind. As such the present education fails to bring out the various
inter-relationships man holds with the whole universe, and
to reveal man as man, as an end in himself. As a result,
man becomes incapable of reflection to attain the wholistic
view of life, but petrifies himself in fear of survival and
decays within his shell of ignorance.

Therefore, in this work, it is aimed to bring about an
education system that would help man to know himself in
terms of all his relations to nature. To help him recognize
himself, as a being in the progressive, historical process
of nature, and to apply that knowledge towards the achieve-
ment of human welfare. And accordingly, this education
may be called as nature-education.

Nature-education is of particular importance to the pre-
vailing social conditions, because, the prevailing social
conditions threaten mankind with disaster. This disaster
is wrought with false notions and pretensions. One such
false notion is that man is an all mechanical and material
being, craving for more and more material prosperity; while,
philosophy shows clearly, that the human race and the inani-
mate world, the world of living creatures as well as the
world of culture, are all evolved by stages, from very
different antecedents. 4 This aspect of evolution indicates,

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4 Ref., John N. Daaeley and Raymond J. Nogar, THE PROBLEM OF
that the historical process of nature is more than that of
physico-chemical entities, and that it is for man to realize,
if it is divine and spiritual as well.

In the process of developing this system of education,
philosophy, as a normative order of study is warranted to
provide its right basis, aims, means and method. This brings
philosophy in the service of mankind, to determine the sig-
nificance of, knowledge of facts and ultimate knowledge,
to human welfare and to provide the necessary ways of acquir-
ing that knowledge. Here, philosophy is called as philosophy
of education. In the teaching-learning process, philosophy
of education propounds the principles of education and gives
guide-lines to its practice.

In education, we see a synthesis of knowledge gained
in various other branches of studies. All, physical, natu-
ral and social sciences are drawn upon and interwoven into
one harmonious whole. As such, philosophy of education be-
comes a co-ordinator and as a co-ordinator, philosophy of
education has to be synthetic in its approach.

This high order study, education, is in turn deduced
from axiology, which is based on metaphysics and epistemo-
logy. This makes John Dewey call, philosophy as the gene-
ral theory of education, as a deliberately concluded practice.5

5 John Dewey, DEMOCRACY AND EDUCATION (New York: The Macmillan
In this vast realm of thought on education, one may view nature-philosophy as the school that specifies a process of education which is more congenial to the child, the learner in general and the teacher. And, nature-education in its philosophical perspective is concerned, with the development of education of man in congruence with the necessities and demands of the path towards perfection of mankind. This education is to show man, how he has evolved in terms of his relationships with nature and his society, and also to accredit him with the clue to realize the Ultimate Reality.

1.1 Method:

The method adopted for this work is the historical method. The historical method is adopted because, reality is itself a historical process, and in this historical process, every moment is an historicity in itself, based on the past that has evolved into the present. And the present itself is progressing into the future with no exclusive dividing line in time scale. Moreover, this historical process expresses itself in a scale of forms of ascending order, where man is at the apex with the rest of the living beings.

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in the immediate lower order, the organic, the inorganic and the physical or cosmological forms being its precedents. In this scale, there being no exclusive dividing line between the various stages, one can only visualize, 'levels', as Errol E. Harris rightly conceptualizes. Besides, all the forms in the scale overlap to make the process a continuum. In this continuum of emergent forms, every higher level transcends the lower, not in that it is different from the lower, but, in the sense that it encompasses in itself not only all the ingredients of the earlier but is also something 'more higher', advanced and progressive, ultimately leading to the human being.

It is a study of man in his historicity and its application to the education of man. The spirit is scientific and true to the sentiment of Descartes, it is an attempt to expose what one encounters in oneself or comes across the great phenomena of the world. Such a study cannot but be an account of the observations of the phenomenal world and of its harmonizing aspect, which one finds in such observations. This is a method to discover man, through an analysis of the various relations or presuppositions, of the fact that man is an historical entity and to synthesize them together to bring about the education of man. As such, it is a critical method of constructive nature and it is like,
a process of developing the implications of a proposition and displaying its connections with others in some systematic body of knowledge the structure of which becomes apparent as we proceed.

According to Collingwood, to know the truth of a proposition necessarily means, to know the problem it can solve. To discover the problem and its solution, an historical investigation is required. And it is this historical study that has provided the proof, for all the theories of philosophers, all through the ages. As such, a study of nature-education, invariably demands an inquiry into the realm of natural history. True to the contention of Collingwood, metaphysics is concerned with the absolute presuppositions and its method is to analyse the thought of natural scientist, so as to bring out the presuppositions and to decide their absoluteness. Therefore, critical, historical method becomes the proper tool for our study. It is more in agreement with the scientific historical research, as Errol E. Harris putsforth, because, in this method, the evidences are sifted and, 'the facts are determined not on hearsay or authority, but by direct scientific investigation.' Here, our proposition is to know man in nature and find the impli-

7Ibid., p. 37

8Ref., Collingwood, ESSAY ON PHILOSOPHICAL METHOD (Oxford, 1933), ch. ix, 3.

cations of that knowledge in our effort to educate man.

Analysis And Synthesis: Our method is both analytic and synthetic. It is analytic in the first instance, because it is a systematic, analytical study of the process of nature and man through the ages, where every stage of the process of nature is observed as an isolated phase. In the second instance, it is synthetic in the sense, the evidences gathered during the first instance are all synthesised to gain the overall view, which reveals the various phases of the process of nature, to be only seemingly isolated phases. They are not really isolated phases because, the synthetic approach shows the whole process of nature, as a process which culminates in all-inclusive comprehensive real.

In order to get a thorough knowledge of man, we set forth in the second phase of this work, to achieve an historical account of man in nature, the nature-philosophy of man, as given by the natural scientists, the metaphysicians and the nature philosophers. This study of man is not a study of closed order, and as implied by the process of history and the method, this study shall be open for further inquiry and progress.

As metaphysical analysis is continuous with the scientific analysis, this process of study, has for its basis, the total experience; the experiences that lead to knowledge
of facts, and the experience that lead to ultimate knowledge. It is only from experience, we intuite the meaning and im-
portance of the fact that man is a part of nature, and in
the light of the same experience we deduce the problems of
present day man and try to solve them.

The problem of present day man, being the problem of
not knowing man in his natural setting and its consequences,
we try to know man, accordingly, from the nature-philosophy
of man. As this forms the second phase of this work, there,
an effort is made to visualize the various relationships of
man to nature. From the known particulars gained in the
analytical stage, we move to the speculative, as we synthe-
size the knowledge thus gained, into the principles of edu-
cation.

The real value of the historical method is that, the
past remains, encapsulated, in the present, and it is a
study of the former, the past that brings about a proper
understanding of the latter. As the process is continuous,
only an historical perspective can expose it and an histor-
ian is called for. Further, the continuity also means, that
there is an identity running through out its course, to justi-
ify the claim that the problem of one age is as well the
problem of another. And in this light, our trying to find
solutions to the problem of present day man, from a study of
man as an integral part of nature, and of reality is not in vain, because it will enable us to get a total picture of past, present and future of man.

By reflecting upon the facts, we also trace the underlying reality of the universe.

For, this to take place, a philosophical history of thought is taken up on the lines of Hegel's history of philosophy, as Errol E. Harris claims to be the necessity to know the eternal problems of philosophy. This philosophical history of thought being based on observations of all about nature, it becomes nature-philosophy. And this philosophical history of thought on nature also demonstrates that the historical process, as grasped by the human mind is ultimately a dialectical outcome of the reality. It is a dialectical outcome of reality in the sense, the origin and as well as the end of the process, with human consciousness as the frame of reference, seems to make it clear that there is ultimately something of which there is consciousness alone.

All these make it known that our method is not only descriptive but it is also critical and dialectical. We also reject as Collingwood suggests, the method of, 'scissors and paste', history, because, description is necessary

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10 Ref., Ibid., pp. 33-34.
though, it is not enough and,

the dynamic of the process of historical change \textsuperscript{11} which is the dialectical principle of the process

has to be grasped to arrive at a comprehensive picture of

man in nature.

\textbf{1.2. The Sources Of Study:}

Having discussed the method of study adopted here, let us pass in review to the sources of study.

Natural history in its philosophical perspective, forms the broad area of study. From this vast area, natural history of man, and evolution, with stress on the descent of man in the universe, provides the necessary basic knowledge. It forms the basic knowledge because, it is a study of man in nature. To learn about his origin, development and progress and to make use of this learning to bring about happy and harmonious life of man. In addition to the natural history, thoughts on education are also drawn upon, particularly of those thinkers, who propounded the ideas of the type of education, that would help man to avoid his own loss in a hostile world order, that ensnares man in his ignorance and confusion. It is a study of nature—metaphysics with singular reference to man—with man as the main focus

\textsuperscript{11} \textit{Ibid.}, p. 38.
of attention.

Nature-axiology forms the other source. It is the study of values, as deduced from nature, and it is to help in framing the ethical and aesthetical aspects of education of man.


To this, *Philosophy Of Nature*, by Jacques Maritain, and A. N. Whitehead's thoughts on nature-philosophy add on, with of course, the countless naturalist's thought of the past, as Anaxemenes to Hegel, forming the background of study. Regarding educational thought, Rousseau, Pestolozzi, Froebel, Rabindranath Tagore, John Dewey, Bertrand Russell, and Donald J. Butler contribute the major sources.

A. I. Oparin, in his works, *The Origin Of Life On The Earth* and *Genesis And Evolutionary Development Of Life*,

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shows very clearly, as to how the process of evolution proceeds. Starting from the emergence of our solar system, he traces the process of evolution up to the emergence of man. In his account, the universe is a material expanse in one state or other, in gaseous, liquid and solid states. It is from the gaseous state that our solar system comes into being, due to the gravitational power of the sun. The same force of gravitation, in action, brings about the planets, of which earth is the third planet, around the sun, which is also the centre of the system. Therefrom the study is concentrated on the earth. The earth, which was a burning mass in its early history, started cooling down, in which process a thin gaseous atmosphere evolved around it, to be soon followed by water and enormous water vapour. This cooling process made the earth a violent planet, with continuous cloud formation, followed by thunder and rain, volcanoes and earth movements for millions of years. And in the process, the atmosphere evolved dicerbon and cynogen particles which evolved into bigger molecules very easily, because, the then atmosphere of thunder, lightening and a sea rich with dissolved chemicals provided a congenial environment for the organic processes to set forth. These bigger molecules evolved into the co-aservatives in the primordial sea, which is also called as the organic soup, as it was abundant with
organic reactions and their products. From co-aservatives emerged, the first cell-like entity, which evolved into bacteria and such organisms with a diffused nuclei, and the process of biological evolution spun its progress therefrom. As the macromolecules took to the shape of nucleic acids and there emerged the distinct nucleus, the unicellular organisms such as, amoeba, euglena and so on came forth.

The evolution of life then progressed through the levels of lower organisms as, thallophytes in the plant group and invertebrates in the animal group to the higher organisms as the tracheophytes in the plant group and vertebrates in the animal group. The thallophytes are those plants whose body structure consists of a thallus, that lacks distinct water conducting tissues as are found in the tracheophytes, the gymnosperms and the angiosperms. So also in the animal group, the lower animals lacked the vertebral column and are therefore called invertebrates, while the higher animals, the vertebrates possess the vertebral column.

It is from the vertebrates, that the mammals have evolved and in turn have given rise to man.

One finds a steady and gradual progress from the lower, single celled living thing to the higher multicellular living
thing. It is not only that they have evolved in body structures, but they also show an evolution in the ways of existence.

Most of the evolutionists and biologists prove this process of evolution with the help of various experiments and fossil studies. Regarding the emergence of our solar system, there is also the idea of the erstwhile bigger sun breaking up, into pieces to give rise to the planets to form the solar system.

Charlotte J. Avers, in his *Evolution*, gives a vivid explanation of the evolution of the higher animals, the vertebrates. He also shows how genetics and ecology play their part in evolution, and proceeds to unveil the emergence of man, with his elaborate treatment of the mammals and anthropoid evolution, in particular. He says, the way the homologous and analogous structures of organisms contribute towards convergent and divergent evolutionary groups, show the relationship man has with other animals. He also says, the comparisons made between the living-forms usually reveal the apparently similar anatomical, biochemical, physiological or other genetically based features, as the outcome of convergence during evolution, in the vast majority

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of cases. And while talking about homologies he says that, what appears to be different structures, behaviours and lifestyles turn to be genetically related, because there is, an underlying basic plan, common to the superficial differences and the pathways of their coming into being. For example among the mammals, it appears that the arm of a human, the foreleg of a horse, the wing of a bat, and the flipper of a whale are all different structures, as each represents an adaptation to a very different and distinctive function of locomotion. But, morphologically different though, they are all anatomically similar, because the skeletal plan of the structure is essentially same in all. And again, each one has undergone modifications that suit the different function. These underlying similarities help us to trace the genetically controlled evolutionary descent.

William T. Taylor and Richard J. Weber, in their, General Biology,14 give a detailed account of the process. Starting from chemical principles, they explain the whole biological process, the whole of plant and animal evolution in a systematic way. According to them, the protoplasm is chemical by nature and constitutes the living material that goes to form the cells. Though cells may differ in function,

as per the ecology and physiology of the organism or organ they make up, they are all made up of protoplasm. And the cell structure show a basic, general pattern of cell-membrane, cytoplasm, nucleus, mitochondria and so on. Again, the system shows that the unicellular, protozoans evolved into the multicellular organisms through the various phyla as porifera, coelentrata, platyhelminthes, aschelminthes, annulida, arthropoda, mollusca, echinodermata and chordata.

Here, porifera and coelentrata form the simple diploblastic or two cell-layered organisms with only cellular level organization and form such creatures as corals and jellyfish. The platyhelminthes and aschelminthes show the emergence of organs and are triploblastic or three cell-layered and form such creatures as flat worms and round worms. The annulida, arthropoda, mollusca and echinodermata show the emergence of organ system level organisation. They form the ringed worms as earth worms, insects, snails and starfish. These creatures also show true coelom, endoskeleton, well-developed vascular system, calcareous structures and structures of calcium carbonate; all precursors of the arrival of chordata. It is also here, that we find the clever creatures as ants and bees whose behaviour and life pattern are full of ingenuities, that makes the observer look beyond biology for explanation. Finally, in the phylum
chordata come the subphylum vertebrata of which the mammals form an important class. And it is in this class, we find man. Further, in vertebrata we find a progression from fishes, water living creatures to amphibians as frogs that live both in water and on land, to reptiles, that live mostly on land, to birds and mammals. Here again, there is an array of beings of which, the organism with placenta form an important and advanced group.

In this group are found the shrews, bats, cats, dogs, lemur, monkeys, apes, man, whales, dolphins, elephants, cows and so on.

In this work on biology, a great lot of proven explanations are given to various biological activities. Ecology, evolution, genetics, physiology and morphology are all taken to account. The various physiological and morphological aspects reveal the total relationship man has with the rest of the biotic realm, and place him amidst the world of living beings.

To sum up the source for considering man as a being in the process of becoming of nature, reference is made to Evolution. In this work, Ernst Mayr says that,

Mans' world view today is dominated by the knowledge

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that the universe, stars, earth and all living things have evolved through a long history that was not foreordained or programmed, a history of continual gradual change shaped by more or less directional natural processes consistent with the laws of physics. Cosmic and Biological evolution have that much in common.

He also defines biological evolution as change in the diversity and adaptations of populations of organisms. Here reference is made to Lamarck for his principles of, (1). the existence of built-in-drive in organisms toward perfection, (2). the adaptive capacity to environment, (3). the frequency of spontaneous generations of mutations and (4). the inheritance of acquired characters. To this, Darwin's ideas of, common descent and natural selection are added.

Ernst Mayr proceeds to state that it is essentialism, since Plato, as Karl Popper calls it, because, the world and its variable manifestations are incomplete reflections of a limited number of unvarying essences. As such, genuine change could come about only through the origin of new essences by creation or by mutation. He also says that, every population of organisms consists of distinct individuals and contradicts it with population thinking, as the mean values of population thinking are only abstractions, while the variant individual has reality.

\[16 \text{Ibid., Chap. 1, p. 3.}\]
It is these variations, called as the gene-pool, in terms of genetics that makes gradual evolution possible. It is also the same high degree of individuality of biological systems, that has made possible, the phenomenon of, 'natural selection', first observed by Darwin.

The selection pressures themselves change with seasons through years and with geography, as each species is unique as is each eco-system. And, it is also shown that, the variations in behaviour serve as the pacemaker in evolution. For example, the selection of a new habitat or food source, sets up new selective pressures that may lead to adaptive shifts, as the conquest of land or air were initiated by shifts in behaviour.17

Ernst Mayr also gives, a time scale of four and half billion years and more for chemical evolution, followed by four billion years for atomic evolution, from which evolved the chemical molecules that in turn eventuated the biological evolution. A period of two billion years, up to present date is assigned for biological evolution. In this enormity of time, oxygen comes into the picture of atmosphere only for the past two billion years and it is after the arrival of photosynthetic bacteria. The cells with distinct nuclei

17Ref., Ibid., pp. 9-10.
appear only from one and half billion years ago and later, and while the multicellular plants and animals show up even from one billion years or so, most of the vertebrates and land plants occur only for the past four hundred million years. And mammals appear from hundred million years ago and onwards, with the primates showing up for the latest fifty million years. The human ancestor, Australopithecus is found only for the past five million years and finally neandralthal man comes into being only around half to one tenth of a million years or so and gives rise to the modern man, who is still evolving.

In this process of evolution, the chemical and biological evolutions are found to be parallel phenomena, contributing mutually and progressively.

This biological evolution of man is followed by the social evolution, which is under the influence of both biotic and cultural factors. This may also be called as cultural evolution. The cultural evolution is found to be rapid, due to the ability of transmission of learned information from generation to generation. On account of this factor, today, man seems to have a sway over his environment, which he should not use to destroy himself and nature. Therefore, advances to be made in directions that are adaptive for all mankind, would be a realistic evolutionary objective.
In the same work, Francis J. Ayala states that the result of adaptation to environment will often reflect environmental changes. And R. C. Lewontin says,

It was the marvellous fit of organism to the environment much more than the great diversity of forms, that was the chief evidence of a supreme designer.

Then he adds that the organs of extreme perfection, seem to be the best intuitive demonstration, that, 'a divine artificer is at work'.

Errol E. Harris, in his works, builds up a philosophical thought in its right direction and setsforth on a laborious path to explain the entire historical process of reality.

He traces metaphysics through various sciences, as of physical world, the realm of life, and mind.

In an historical study of the philosophical problems, he says that the human mind knows nature in science and finds itself to be a product of the same. Questions on mind-nature relationships are connected with, (1). the conception of nature, resulting from scientific discoveries set out in

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18 Ibid., p. 115
19 Ibid.
Errol E. Harris, NATURE,MIND AND MODERN SCIENCE (London: George Allen & Unwin, 1968),
cosmological theory and, (2), the conception of mind evolved by the philosophers.

He also says that, one finds a historical development of all these conceptions, and gives the following account.

The Greek conceptualized nature as a living organism and as a realm of perpetual change. As such, natural things and events, they thought, must partake of that which is eternal, to provide determinate knowledge. This condition confronts the human mind, which is in dependence and closely associated with a natural changing entity, the body and also cognizant of eternal (knowledge), realities.

The period of Renaissance held the view that nature was purely mechanical and material, far from being alive, with its changes being determined entirely by efficient causation. Here, mind has no place in corporeal nature but something set over and against the corporeal nature as its knower.

The modern conception of nature reduces or solves this duality. Modern thought considers nature as a continuous process of evolution, in which the human organism comes into existence as a development from earlier forms. The purely physical now appears, as an early phase, in a development of which the later phases are forms of life; and in the higher manifestations of the process, we find mind and,
consciousness. As a phase in such a development, what has hitherto been regarded as sheerly mechanical, turns out to be not so any longer. It is so because, nothing what so ever can develop or evolve from a purely mechanical realm. The process of nature is of course, a process of change, but not for that reason unknowable. The theory of knowledge consequent to the modern conception of nature makes the relation of mind to its objects as well as to the human body, intelligible by seeing in the evolutionary process the self-evolution of a consciousness in which the human knowledge is a later stage. It is a knowable and intelligible process, 'because it is, throughout, the process of coming to be of what is essentially and entirely intelligible - namely mind.'

Taking up Hegel's thought on nature, and setting aside its criticisms of Croce and Gentile, Errol E. Harris, gives the account that, Hegel regarded the universe as one continuous process of dialectical development. With the mind immanent in every phase, each succeeding phase is one of greater explicitness. Consciousness emerges only at the higher level, a point overlooked by his opponents. Hegel's contention is that, thought is present and at work in a level

far below that of consciousness. Nature is conceptualised as the idea, under the form of externality and the emergence of consciousness is the stage, where mind becomes aware of the nature as external object. But, as nature is itself mind, in the form of other-being, consciousness is self-consciousness. The idea of nature as the other-being, is mind implicit, or 'petrified', as Shelling said and cannot be appropriate to any stage of knowledge, even for empirical science. Self-consciousness has to advance, because, logic does not make up whole philosophy, and logic is the reflection of mind on: only the cognitive phases of consciousness. The mind must go on to know itself as the spirit in nature and that which is developing out of it. It is stated that the next step shall be the development of self-consciousness as the philosophy of nature. And as long as natural sciences are concerned only at the level of understanding, they cannot take up this task. Thus, he says the transition from logic to nature-philosophy is, 'only the passage from one level of self-consciousness to the next higher level.'

the finite mind is said to emerge at that point in the dialectical process where self-external matter having overcome its outwardness in organic functioning, goes over into the inwardness of subjectivity

\textsuperscript{22}Ibid., p. 245
and realises itself as soul.\textsuperscript{23}

And the succeeding phases are said to be transcending what is finite in body and soul, to develop still higher truth implicit in them.

Considering the modern science and quoting the work of scientist Driesch, he shows that, through experiments alone, one cannot explain the biological aspects, without recognizing the organism as a special kind of whole. Organism is a special kind of whole because, physico-chemical aspects, which alone can be studied through experiments, do not give complete explanations to life-phenomena, even though the biological activities are bio-chemical or physico-chemical. For example, there is the regulative aspect, all unexplained. Here, J. S. Haldane's view that, to know the organism, it should not be separated from the environment, makes good the claim for oneness of nature and reality. For, the organism is in all its aspects, in structure, function and so on, one with the environment,

Thus, biology is to consider nature as a single system and as such, nature-philosophy becomes an absolutist philosophy, in harmony with the findings of biology. For, the regulative aspect is also the unifying cause, as Driesch finds.

\textsuperscript{23} \textit{Ibid.}, p. 248.
Further, if the activity of an intelligent and self-conscious mind is the ultimate of the process of evolution, then he says we are impelled to conclude, what is immanent in every phase of the development, as mind.

This view of nature as the process of self-evolution of mind, he says would affirm the position of Greek philosophy of nature, that of Spinoza, Leibniz, Hegel and A. N. Whitehead. Spinoza held nature as a system of degrees of perfection, with God or Substance as perfection itself, while Leibniz held the view that reality tends to be a series of monads of increasing clarity of perception culminating in God. And Hegel views the reality as, dialectical process of the Absolute mind.

Finally, Errol E. Harris states that the philosophy of nature is part of the area of overlap between science and philosophy as species of knowledge and that the philosophical theory demanded by modern outlook has to maintain the following five main theses:24

(1). That mind is immanent in all things,
(2). That reality is a whole, self-sufficient and self-maintaining and that coherence is the test of any theory about it.
(3). That the subject and object of knowledge are

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24Ibid., p. 206.
ultimately one and the same thing viewed from opposite and mutually complementary standpoints. (4). That events and phenomena can adequately be explained only teleologically and, (5). That the ultimate principle of interpretation is in consequence, the principle of value.

Regarding the source of thought on education, Jean Jacques Rousseau, Father Pestalozzi, Froebel, Herbert Spencer, Rabindranath Tagore, Bertrand Russell and John Dewey are the major contributors.

Jean Jacques Rousseau (1712 to 1778) : Most of his educational ideas are given in his book called, Emile (1762). Rousseau is considered to be a bridge between the idealists and naturalists. In his Emile, he considers education as a practice consisting of five learning periods, the infancy, boyhood, early adolescence, adolescence and adulthood. For him, education has to be in accordance to the natural development of the learner. He says that every subject has its own age and period of study and it is according to the growth and development of the learner that the subjects are to be taught. The teaching-learning process has to be in tune with the natural process of development of the child.

According to Rousseau, education in the early periods is for the development of the physical wants and natural habits of the child. As the child grows, education for

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intellect is introduced. Here, high importance is given to language learning and it is to be taught through speech and games. He stresses that the education has to be in accordance to the 'will' and 'can' of the child. He also proposes differential education to boys and girls. For him, education has to be always through experience and where ever it is possible for the child to learn from experience, it should not be taught from books. Education for mind is recommended only from the early adolescence and that it is to be introduced only in order to help the child in its natural life. This principle is in confirmation to the utility principle and the problem-solving technique of modern education. In this phase of learning the learner has to be taught such actions that would lead to the development of mind. Then in the adolescence stage, the learner is to be introduced to the society and life as an individual in a group, where he would learn moral and aesthetical aspects. At this stage, he also speaks about religious education and lessons on passions. Now the teacher has to make the student gain acquaintance with the problems of society, politics and government. In this period they are also to be taught about marriage and parentage.

Rousseau puts forth the view of intrinsic goodness in nature, and states that the guide to human actions lie in the
inner light of consciousness which man finds in his existence through his intuition. He also speaks of the universal will in nature as the ultimate reality and that it is also the freewill and a process in time and makes man attain a happy and harmonious livelihood. For him, education is in short, the growth, liberty and happiness. This makes him ask for, active, individualistic education for unity in plurality.

 Pestalozzi (1746 to 1827): He founded schools at Bugdorf and Munchenbuchsee and referred to as a great educator of humanity in Yverdon. He came from a spiritual family and had a very good education due to his mother and he himself gave everything to the cause of education. He was always kind to all poor and all learners, and had a parental love for one and all. He told that natural laws were the only laws on which education has to be based.

His educational practice was to let the children learn through experience, work-study and trades. Work-study formed the basis of his system of education and his institution was situated in natural setting, which environment provided a fertile ground for the growth and development of the varied talents of the learners. For example, to learn about river, a geographical study, the children were taken to the nearby riverside, that afforded all practical observations
as to its flow, soil erosion, estuarine and such. His school was rich with cultural activities and involved dance songs and music.

The lessons were prepared by a group of experts, who were also teachers. These lessons were all life-oriented and had the immediate life-situations as the theme.

Little children were taught everything through play and activities. Arithmetic was taught through counting pebbles or plants and language through talk and song. Lots of sports and intermittent leisure made learning-practice a joyous endeavour, for the learners. Pestolozzi gave very high importance to food and the children were fed with rich, nutritious and often natural food. Health was directly under the charge of the teachers.

His system of education shuns negative method and declares that there is no place what-ever for punishments in schools. He involved students in administration and the senior students often helped the teachers in the very teaching-learning process. For him, the learners were to be trained to earn their livelihood and to become self-supporting people.

Froebel (1782 to 1852) : In his work, Education of Man, Froebel states that there is a unity transcending the opposition between work and play, for both are means to the individual's
self-realization. From this he proceeds to state that the play way method is the only method of learning and that the child has to be taken as an identity-in-itself, as a flower of its own kind.

Froebel visualised in education a means for synthesizing human personality and universal values. In his kindergarten, the school is likened to a garden and the teacher to a gardener who tends his pupils as though they were tender plants. Moreover, this garden also provides an environment in which the whole school would form a means for the pupil to fulfil his own natural cravings that express in the form of his being, and may thus be helped to grow in his own nature. Froebel says that the external means, the environment, the inner significance of work, play and activity are all media for the evolving inner spiritual life of the child.

The task of education is the proper and natural development of the innate capacities of the child and its ability to appreciate the natural values of beauty, truth and goodness. He says,

Man works only that his spiritual divine essence may assume outward form, and that, thus he may be enabled to recognize his own spiritual divine nature and the innermost being of God.

Herbert Spencer (1820 to 1903): He gives his thought on education, mainly, in his book called, Education: Intellectual, Moral, and Physical. In accordance to the naturalists tendency, Spencer at first considers the child as a tender, baby organism. He contends that the human babe needs an extraordinary care in its bringing up because, it is having an extremely prolonged infancy and childhood, for till late adolescence and in some cases till early adulthood, the human child is dependent on its elders for its happy livelihood.

His education is initially for physical care, coupled with it, in due course, would follow the education for the senses and the intellectual education is to be given at a later stage.

Spencer's education has five objectives and they are, self-preservation, securing the necessities of life, raising children, maintenance of social and political relations and enjoyment of leisure. His theory of education is for the maintenance of natural order and acts as an aid for its achievement. He propounds an education in conformation to the natural processes of growth and mental development. For him, education has to be a pleasurable experience, to engage the spontaneous activity of the child towards knowledge acquisi-

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tion, with book, body and mind being given equal importance.

Rabindranath Tagore (1861 to 1941): Tagore practiced his philosophy of education in his, world renown Shanti Niketan and Visva Bharathi. While his Shanti Niketan and Sri Niketan fostered nature-education for children and adolescents, Visva Bharathi was started to foster international amity and to form a centre to study world brotherhood and universal citizenship. A philosopher of Nature, and a pioneer educationist, Tagore, gives much of his thought on education in his work, Personality.  

Education is for the total development of the individual in terms of physical, intellectual and spiritual aspects of man. It is to start with the education of senses, and all along the process, sympathy and feeling are to play a guiding role. Initially, it is to develop the natural instincts of the child in harmony with nature, which was itself the school in his system. In this school, life is the means and education is to be a way of life where teacher and pupils are of such cordial relationship that learning becomes a common affair, under the loving guidance of the teacher. In contrast to the present day man’s louly aims, he claims that a lighted lamp is only the end and not a lump of gold.

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As a perceiver of divinity in anything and everything the world over, he speaks of nature as divinity in repose, and says men away from nature are like poetical lines torn away from the song. His philosophical aim is, divinisation of man and humanisation of God. For him, God is living in the haunts of nature as does man himself. His education is for peace, harmony and love.

In his school, the children learnt through play, and even tree-climbing formed a part of their cultural activity and curriculum. His school was an idyllic place, more of a nature-garden where the teacher and the taught build their classrooms, and undertake lots of vocations and his 'Siksa satra', was actually a trade centre. For him, the ultimate aim of education is the realization of the truth that the life-'s conclusion is the union with all in an infinite bond of love and to know that the man's true relationship with the world is that of personal love and not of a mechanical law of causation.

He viewed the whole world as one with no divisions and all the living beings as brethren. He never believed in paper education and statistical data and shows his disgust for the indolent system of paper education in his song 'Parrot training'.

John Dewey (1859 to 1952) : Dewey claims the whole philosophy
as the theory of education. It is the organism and the environment that form the data of education, for him, and it is the interaction between the organism and its environment that constitutes experience. He states that the individual learns through continuous interaction with his environment and as a result acquires the knowledge to control his environment and to modify it in due course. Education is for Dewey, an active process of experiencing, which is reformed towards a more significant meaning.

There are no external aims to control education, for education is growth and as there is nothing more important than growth to the learner, education is to help man outgrow to prepare himself for future. Thus, the learner is the deciding factor in education and nothing external to him can do that. The educative process centres on the child's needs and not formalised. As growth, education is itself the child's needs, purposes and interests, with a whole hearted look for the child's welfare. It is again, a problem solving method of education where the problematic situations form the necessary stimulation.

Bertrand Russell (1872 to 1969) : Bertrand Russell gives most of his thoughts concerning education in his works titled, On Education and Education And Social Order. He

starts with the educational ideal, and gives an account of
the education for character followed by that of the edu-
cation for intellectual aspect.

As for the aim of education, he takes four characteris-
tics, which seem to be the basis of an ideal character,
and they are, vitality, courage, sensitiveness and intelli-
gence. And to make these qualities very common, Russell
propounds proper physical, emotional and intellectual care
for the young.

In this matter, Russell emphasizes on the feeling
aspect of the teacher and contends that the teacher should
never be deficient of love, or else there would be neither
character nor intellectual development. This love consists
essentially in feeling the child as an end, and Russell also
says that, love, which is in its form of parental love is
universal in occurrence, has to be recognized by every one
and by the teacher in particular.

Then, he proceeds to say that it is also necessary for
the educator to have a right conception of human excellence.
He claims that our education should aim at the needs of the
modern world, and that it includes people with more sympathy,
imagination, intellectual suppleness, less belief in bulldog
bravery and more belief in technical knowledge. For example,
he says, the administrator must be a servant of free citizens
and not a benevolent ruler of admiring subjects.

Talking about the education of courage, he contends that it has to be attained through the development of impersonal outlook and states that the impersonal outlook can be effortlessly developed by cognizing certain things in nature, as parental love, knowledge and art, which take one beyond oneself.

Here, it is the expansion of the self and its transcendence upon visualizing the wider horizons of the world that is aimed at, such that the child is developed in due course to be a man of mighty knowledge that lets him see himself as a part in it, while all others around the world would become a cordiality for the mutual happiness and prosperity.

His education for character, consists of, abolition of fear, enhancement of playfulness, constructiveness and avoidance of punishments. For him, discipline is to be attained through education. Talking about fear, he soberly states that the way to happiness of mankind lies in our bringing about fearless men, who alone can create and sustain the good world or else we shall let our children also suffer the wrath of countless ancient fears that lead to futile wars. He says that, if only we love our children, they will grow into free intelligent men, as opposed to the stunted growth
of terrified youth, whose intelligence was too cowed to prevent futile wars.

He also speaks of sex-education to help people learn the hazards of later life and to help prepare the learner for good parentage, health and hygiene in life.

His intellectual education is for the development of open-mindedness, concentration, patience and industry. He also takes educational venture as adventure in life.

For him, as well, education has to be child centred and its ultimate aim is, one world, undivided and so cultured that it will be completely free from coercive forces and would culminate in world brotherhood and universal citizenship.

As we come to the end of the sources, mention should be made to the fact that, most of the thinkers referred to under one head, may also provide thoughts on the other, as Dewey rightly and aptly declares that philosophy is the general theory of education.

As one reflects upon the above sources, one may find the philosophy of man as given by the above sources, to be scattering fresh light on his path to progress. It shows man as a being in the process of nature, an evolute of nature. His life is from origination onwards destined with nature. Birth, growth and death of mankind goes with the world around.
All non-living and living things are closely and vitally related to man and his progress.

Man may not be conscious of the fact that he is one with the non-living and living things of nature. And, whether he is conscious of this fact or not, the phenomenon of his evolution in nature, proves that fact flawlessly. Man, not only has that much in common with the rest of the world. For, he continues to evolve in the endless process of nature, which is itself evolving. As such, the human lot is ever with and in terms of nature, though he may or may not become conscious of those terms.

As planning based on flimsy grounds of knowledge of man, is improper planning, it leads to his estrangement in nature, and eventuates his loss. Thus, man has to start planning properly, that is, to plan his actions on the basis of knowledge of man, as a being in nature. If this is to take place, man is warranted to know philosophy of nature, because philosophy of nature alone gives the real and right knowledge of man.

Further, the above sources also reveal that man in nature is found to be endowed with a value realizing aspect, the consciousness. And this in turn makes man to transcend material or physico-chemical realm and express himself as an ethical and aesthatical being, which leads to his learning
about his inner self, and allows him to grasp the reality.

Nature-philosophy, also makes it clear, that human welfare lies in the harmony and co-operation between man and non-living realm, man and other living beings and man and man. This may be deduced from the fact that, nature provides the resources for human welfare and it has also provided man with effort or labour, and it is for man to become conscious of this fact and make use of his labour to enhance nature’s resources for his welfare. Here, man has to remember that this welfare is mutual welfare for the whole nature.

As such, in this perspective of the descendence of man in the process of reality, there is no room for fear and doubt. There is no room for fear and doubt because, it is the whole process of nature, inclusive of himself, that sustains and decides his future. And he can, by himself, only help or encourage that process, if he so wishes or simply let nature take its own course. Man must know this freedom of action and to know which he has to acknowledge the following:

(1). that he has evolved from the simpler manifestations of reality as the non-living, and the lower living forms and

(2). that the progress from lower life forms to higher life forms is itself an expression of the perfection drive
inherent in the process of nature.
That is, man should know that, even before his becoming con-
scious of himself as a living being influenced by the whole
nature, his organism has been, like any other organism, pro-
gressing from lesser living capacities to greater living
capacities, which shows that the very process of nature has
something as consciousness to account for the perfection
drive. And this makes it clear, that it is that conscious-
ness-like-thing in the process of nature which should also
decide his future, and he can only be of help to that.

If man doubts himself as a being of nature, inter-depen-
dent on all the other aspects of nature as air, water, earth
and so on, he should be capable of perfect existence outside
nature and apart from those aspects of nature, which he is
not capable of.

If he wishes to doubt his value realizing aspect, the
perfection drive in nature, then he will lose the clue to
trace his inherent value realizing capacity, the ethical
dimension of man and would ultimately doubt his very self.
But, according to nature-philosophy, it would only be a
wishful doubt, and therefore, it would be baseless and
meaningless as well. As such, man finds room, only to doubt
his second thoughts or thoughtlessness of interdependence,
which forms the social element in nature.
With regards to his fear, it may be as follows,

(1). fear from edaphic factors,
(2). fear from biotic factors and
(3). fear from social factors.

Of these, the first two can be overcome by the knowledge of the history of nature, its process and its utilization to mankind, and it may be in the form of judicious resource planning and proper environmental planning. And with regard to the last, fear from social factors, it may be over-come by understanding the importance of mutuality and intermi-nability of interdependence. To achieve this social com-patibility, man may very well turn to the value realizing aspect in him and to the perfection drive, the consciousness-like-thing in nature, which shows that life is interdependence.

But the present day world unfurls a totally different and dismal picture of man and his surrounding world. The prevailing conditions of the human society seem: to be appalling. Mankind is caught up in a veil of threats, false fears, doubts and confusions. This makes man to struggle for a pittance of existence, and as a result eccentricity rules, giving rise to hap-hazard progress. This pathetic condition of man shows that if at all man is to come out of misery and achieve harmony and peace, mankind should do two things;
(1). to solve the problem of not knowing man in the real and true sense.
This means, knowing man comprehensively in all his dimensions, as man in nature. This knowledge of man in nature guarantees human welfare in all its aspects. This knowledge alone, guarantees complete human welfare because, it is necessary even to know or realize divinity, as the realization has to take place, only, as man is in the human form, as a living being of the world of nature. And Brubacher seems to refer to this, when he says that,

the discussion of the nature of human nature is but a continuation of the discussion of the generic traits of reality.

Therefore, in the interests of the living man, it is necessary to know man as he is found in the process of nature, as a being in relation to all aspects of the surrounding world. Here, nature-philosophy comes to the rescue, by providing the knowledge about nature and by helping man to know himself. Nature-philosophy is warranted to provide the knowledge of man because, it is itself, as said by Errol E. Harris, the development of the new phase of self-consciousness, consequent to the discovery that subject and object are

identical, as mind is known as the spirit immanent in and developing out of nature.31 And nature-philosophy is called for, because, knowing man fully is a task which cannot be undertaken by sciences themselves. The natural sciences and social sciences cannot by themselves, account for man, in all his dimensions because, they are only factual descriptions that can help man in simply understanding the process of nature, through analysis. And again, as factual descriptions these sciences work only at a level where subject and object, man and nature are not together and are thus lesser to the level of nature-philosophy, in which there is identity of man with the rest of the universe. Further, nature-philosophy also brings out the various inter-relationships of the process of reality.

(2). To apply this knowledge of man in the service of man, to alleviate human sufferings. Man has to think in terms of utility value of knowledge because, after all the metaphysical inquiries, man is certain of one thing, that mankind is there and that it is suffering, and man has a sense of responsibility to try to solve that problem of suffering. And with regard to education and human welfare, one may conclude, from this nature-philosophy that, all the

31 Ref., Errol E. Harris, MATURE, MIND AND MODERN SCIENCE (London: George Allen & Unwin, 1968), pp. 244-245.
sufferings of mankind emanate from his short-sighted inquiry of nature, and all the existing systems of education of man fail to impart the necessary knowledge of nature. As a result, all the existing systems of education are found to be inadequate to serve the cause of humanity. They are inadequate in their service because, the philosophies on whose basis they have been developed are themselves inadequate. For example, the idealists school fails to recognize the importance of worldly life and accords a second rate treatment to the worldly affairs of man. Moreover, it has led to innumerable divisions of humanity, as there are innumerable idealist theories of reality. As for the materialists school of education, they regard man more as a mere labile, mechanical entity and disregard his inner self and thereby let man lose the foresight of ethics and aesthetics. Thus there is a demand for a new and constructive system of education. And as nature-philosophy gives complete and total account of man, it has to form the basis for that new system of education:

This proposal for a new system of education goes well with the present day world's pining for a new social order, to let man live as man and Harold Rugg seems to support this view when he says,

Industrial civilization is on trial. Its leaders are
asking frankly: Can an interdependent civilization that ramifies around the earth manage itself? The current chaos throws out boldly the opportunity and obligation of educators. "Education for a changing society" implies that we shall introduce youth to the understanding of our rapidly changing civilization. But much more is needed than that. The world is on fire, and the youth of the world must be equipped to combat the conflagration. Nothing less than thoroughgoing social reconstruction is demanded, and there is no institution known to the mind of man that can compass that problem except education.

In every changing culture of the world today, two insistent problems should engage the attention of educators: (1) What are the concepts and problems of our changing civilization which should constitute both the needed social program of action and the outline of the educational program? (2) What are the elements of a creative philosophy which shall be appropriate for the new social order? Our search for a new theory of life and education appropriate to the new and changing culture reveals the inadequacy of the pragmatic theories which are subscribed to by educators generally in the West. Indeed, careful study shows us that the pragmatism of Peirce and Dewey is not a philosophy; it is essentially a method of thought. It is a conspicuously fine phrasing of the experimental method of inquiry. It is an exposition of "how we think" when solving problems. It is an intellectual test, not a theory of life, and hence of education.

We need a philosophy, the loyalties of which shall be so inclusive as to guide men in all the situations of life. Our theory must embrace two attitudes, two outlooks on life. The first is the experimental attitude, the scientific outlook that has enabled men increasingly to master nature. It is education in this attitude that will enable men to device economic government and to master social relations. The second attitude is that of appreciative awareness. It is the all-embracing attitude of receptivity. These two attitudes are fundamentally different, and the techniques of mind that spring from them are equally different. Yet they are not different in the sense that they complement each other. An educational system built upon either one or the other alone

will be incomplete.\textsuperscript{33}

Accordingly, this may be achieved by applying, nature-philosophy of man to bring about nature-education, which would help man to educate himself rightly. Nature-education would let man to learn to live, because it is a programme of education constructed directly from the knowledge of man, as he is, and it is more to solve the problems of mankind.

As nature-education of man means, man becoming conscious of himself, as a being in the process of nature, and nature-philosophy in its account of man helps man to achieve that consciousness, nature-philosophy of man becomes the nature-education proper. And this is given in chapter two of this work, while the third chapter forms the descriptive portion of the system of nature-education in its formal learning-teaching process.

\textsuperscript{33}\textit{Ibid.}, p. 118.