CHAPTER VII

DUALISM RE-ADMITTED: PSYCHOPHYSICAL INTERACTIONISM

The idea to compare man and his functioning to a machine, an automata, is a very old one. According to Karl C. Popper, the similarities which are observed in a functioning of a man and a machine, force the materialists to compare a man with a machine. But he says that, the similarities are so few and of little importance, that if one looks at the differences between them, he will be forced to think in an opposite direction.

Popper gives certain reasons for the above claim. He says that, the fact that a human being is irreplaceable is very important. It is true that organs of a human being can be replaced, like parts of a machine. The observed similarity here, is at the lower level, whereas in the case of organism as a whole, it is very different from a machine. This can be shown by another great difference between the two. That is a human being enjoys life, suffers and faces death consciously. Popper feels that human beings are ends in themselves and this aspect of human beings, raises their value immeasurably. Popper says, "machines are clearly not ends in themselves, however complicated they may be. They may be valuable because of their usefulness, or because of their rarity; and a certain specimen may be valuable because of its historical uniqueness. But machines become valueless if they do not have a rarity value; if there are too many of a kind we are prepared to pay to have them removed. On the other hand, we value human lives in spite of the problem of over population, the greatest of all social problems of our time. We respect even
Therefore, to hold the doctrine that men are machines, is not only mistaken but also is something that lowers the dignity of a man as a moral man.

According to Popper classical materialism viewed matter as something extended in space or occupying space (or parts of space), was ultimate; essential; substantial; an essence or substance neither capable of further explanation nor in need of it, and thus a principle in terms of which everything else had to be, and could be, explained.

He further states that, classical materialism is transcended by explanatory theories of matter in modern physics; Newton's gravitation theory and the very important discovery of an electron by J.J. Thomson and H.A. Lorenz, led to the view that even the tiny atom could be divided.

Matter is not 'Substance', since it can be destroyed and created and neither it is the possessor of properties in the sense of 'persisting' during the changes taking place. In the light of the above advances, there is some change in the earlier view that man is a machine, and has forced materialists to say that men and animals are 'electro-chemical' machines. The supporters of this view are U.T. Place, J.J.C. Smart and D.M. Armstrong in the debates in philosophy of mind.

Popper holds that 'matter' is real alongwith the forces, the fields of forces, the charges, the entities that we find in physics. These are abstract entities, but real, as they affect causally prima facie real things or can explain changes in the ordinary material objects in the world.
The biological view according to Popper, maintains that life must have originated from the chemical synthesis of giant self-reproducing molecules. Thus it proves that dead matter has got more potentialities, that is, besides producing matter it can produce life, mind, consciousness, language, etc.

According to Popper, a great role is played by the individual preferences and skills, in selecting the new environment in evolution. In Darwin's theory acquired characteristics are not inherited. In the theory of natural selection, evolution takes place through "an interaction between blind chance working from within the organism (mutation) and external forces upon which the organism has no influence".

However, Popper disagrees with Darwin with regard to the above aspect of evolution, and holds that organism's preferences, skills, aims, activities are often decisive and it is not only this aspect that makes new adaptations more understandable but also lead to the evolution of that organism. In other words, the organism chooses its environment. And thus man 'chose' the evolution of his brain and mind, by choosing to speak. It is the interaction with language according to Popper, that lead to the emergence of human brain and consciousness of self.

Evolution from materialist's point of view is a process through which all that is potential, or pre-formed becomes actual, Popper finds this view misleading and wrong. For evolution has brought into existence many unforeseeable things. Therefore, for him, evolution is creative.

It produced sentient animals with conscious experiences,
initially in an undeveloped state, leading to the conscious experience of a higher kind and creativity.

Popper while explaining his idea of creative evolution says that, it is a fact that at one time in the universe there were no other elements, other than for example hydrogen, helium, etc. Those who had knowledge about the operating physical laws, could not predict the properties of heavier elements nor could say that they will emerge. Therefore, Popper says, we can reach the conclusion that, something unforeseeable has emerged.

Popper holds that there are stages in the evolutionary process of the universe and that it has produced things, unpredictable and unforeseen at a prior stage. Popper tries to make it clear by introducing 'three worlds' --- world 1, world 2, and world 3 --- each world representing an aspect of life and environment. Thus world 1 according to Popper, is the world of physical objects, which is constituted by, hydrogen and helium, the heavier elements, liquids and crystals.

World 2, is the world of subjective experiences, consisting of man's consciousness of self and of death. Animal consciousness is also included in world 2.

World 3 is the product of human mind and creativity. It includes works of art and of science (including technology). Popper also classifies human language and theories of self and of death, as belonging to world 3.

According to the reductionist idea things at a higher level can be explained in terms of things at a lower level. Popper says that, reduction as a research programme is very important, but he doubts the possibility of achieving this 'reduction' to the lower
level. Popper comments that, the final success of the reductionist programme cannot be claimed, as claimed by Hilary Putnam and Paul Oppenheim.

Some philosophers think that, when we move from a lower level to a higher level, the principle of upward causation can be traced along with the belief that the higher forms cannot act on the lower ones. Society for instance, functions inspite of the death of different members of it. Popper reacting to the above contention says that, a strike in an essential industry, may affect the life of many. An animal can still survive with the death of some cells, in the body, even after removing some organs from body, but if the organism itself dies, then it means the death of all constituting organs. He cites these examples of downward causation, to show that the reductionist programme is difficult.

Popper, an exponent of 'emergent or creative' evolution, says that in the process of evolution different new things can occur whose prediction is not possible. One cannot predict the probability of their emergence, before they come into existence. Consciousness, mind, brain have emerged in the process of evolution. The 'emergent evolution' has been criticised by determinists, classical atomists and supporters of capacity or potentiality theories.

For a determinist nothing is unpredictable. Popper quotes Laplace to highlight the determinist viewpoint: 'We ought ... to regard the present state of the universe as the effect of its anterior state and as the cause of the one which is to follow.'
Assume an intelligence which could know all the forces by which nature is animated, and the states at an instance of all the objects that compose it; ... for (this intelligence), nothing would be uncertain; and the future, as the past, would be present to its eyes.

Popper points out that Laplace, is one of those who accepted the view that because of subjectively insufficient knowledge, we do not know the precise nature of an object and that objective chance like events do not exist. Popper replies that "modern physics assumes that there are objectively chance like events and objective probabilities and potentialities".

While reacting to second criticism of classical atomists, Popper argues that in different bodies and organisms it is only the arrangement of atoms that we find new and this new arrangement can be predicted in principle, and that "new atomic arrangements may lead to physical and chemical properties which are not derivable from a statement describing the arrangement of the atoms, combined with a statement of atomic theory".

The supporters of the potentially argument may argue that, what is termed as 'emergent' cannot be so called in strict sense for there will be 'particles' or 'structures' which has the capacity to produce the thing what is 'emergent'. If it is possible for us to know the 'hidden' then evolution cannot be 'emergent'. The 'Uniformity' that we find in the Universe and the 'invariant' aspect of its law --- due to this we can say that Universe does not change.

Popper taking into account the above mentioned criticisms, claims that there can be 'emergence' or 'creativity'. Popper
points out that, "the system of invariant laws is not sufficiently complete and restrictive to prevent the emergence of new law like properties". He gives the example of the property of development and other properties which occur in the course of time and evolution.

All living organisms, being material bodies are subject to all physical and chemical laws, as they belong to the world of physical entities. The various processes, forces, fields of forces, in the Universe interact with living organisms. Besides this, Popper maintains, that there are mental states and they are real, as real as physical objects in the Universe: and they too interact with material bodies. A good example of this mental-physical interaction he mentions is that of a tooth-ache. One is naturally led to think of interaction between mental and physical from such examples and that it is in the same way Descartes thought of interaction between mind and body.

Popper talks of an interaction between World 1, World 2 and World 3. As explained above, World 1 stands for physical world, World 2 stands for mental states, including states of consciousness, psychological states or dispositions and unconscious states. World 3 consists of products of human mind. Such as theories of science, stories, scientific problems and works of art.

According to Popper, many objects of World 3, we find as material bodies and hence they also belong to world 1, for example, a book, but the content of the book is the product of human mind. World 3 objects have a reality and autonomy of their
own. Since they can further influence a man to bring about other World 3 objects and also can lead to inter-action with World 1.

The interaction and the relation between the three worlds as Popper maintains, can be seen from the following:

"The productive scientist as a rule starts from a problem. He will try to understand the problem. This is usually a lengthy intellectual task - a world 2 attempt to grasp a World 3 object. Admittedly, in doing so he may use books (or other scientific tools in the World 1 materialisations). But his problem may not be stated in these books; rather, he may discover an unstated difficulty in the stated theories. This may involve a creative effort: the effort to grasp the abstract problem situation; if at all possible, better than it was done before. Then he may produce his solution, his new theory. This may be put into linguistic form in innumerable ways. He chooses one of them then he will critically discuss his theory; and he may greatly modify it as a result of the discussion. It is then published and discussed by others, on logical grounds and possibly on the basis of new experiments undertaken to test it and the theory may be rejected if it fails in the test. And only after all these intellectual efforts and these interactions with World 1 may somebody discover some far-reaching application (electronics!) that changes World 1.”

Karl Popper in the above passage, attempts to show that although the theories are the products of human mind, through their influence on World 1, it is proved that they are objectively real and are autonomous. Many embodied objects constitute World 3, which is, result of human thought and efforts. Besides this there are unembodied things or objects, as Popper claims which also constitute World 3. A scientist usually is interested in understanding World 1, but for this purpose he makes use of World 3 as a tool (as theories are the product of human mind). Based on these theories, we get ‘applied science’ and the reality of unembodied objects in World 3 can be grounded in the above facts.
For a scientist using World 3 as a tool it is possible to understand World 1 only through the intervention of their makers, that is through the human grasping which is a World 2 process. Because of this typical interacting relation between World 1, World 2 and World 3, we are forced here to admit the reality of World 2 and World 3. The illustration of capacity and need to learn a language is cited. One's capacity and the strong need to learn a language is something a part of our genetic set-up. Whereas the actual learning of a language motivated by unconscious needs is not a natural process, but a cultural one which belong to World 3. Our need to learn a language interacts with our conscious process of exploring and learning, which has its basis in the cultural evolution. This is how the interaction takes place between World 3 and World 1, through World 2.

An individual, can be said to be a product of World 3 to some extent. Our personality development takes place through our interaction with the material World, the environment and its mastery, with other individuals in the society. The ability to learn and to understand helps an individual in mastering the environment, and most of these processes belong to World 3 are cultural processes.

In Popper's psycho-physical interactionsm between the three worlds, world 2 is of crucial importance. It is in this world 2, Popper includes subjective experiences, ideas about 'self' (and ideas about 'self' are equated with ideas about 'mind'), consciousness, etc. Popper accepts the existence of the 'self' but avoids what is 'questions about' 'self'. For, Popper thinks that "what is questions about self are connected with the idea of
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essences - leading to essentialism.*

Popper holds that we are not only aware of our self but also aware of identity of self, throughout our life in spite of breaks due to sleep and unconsciousness. He considers memory and capacity to recollect as very important requirements of self-awareness.

The individual who feels, hopes, fears, enjoys, dreams, etc. is a 'self'. Each 'self' experiences the above processes and the others can only infer or guess their occurrences since these processes can only be experienced by that person alone. Popper here strongly contradicts with Wittgenstein's views on private sensations. Wittgenstein maintains that our subjective experiences are in no way 'private'.

Popper agrees with Ryle as far as the denial of Cartesian substance is concerned but he still accepts the platonic idea of 'mind' piloting the ship.

Popper maintains that our self is, 'linked with what is usually called character or personality. It changes: it depends in part on a person's physical type, and also in his intellectual initiative and inventiveness, and on his development. Nevertheless, I think that we are psycho-physical processes rather than substances'.

In explaining how we learn to be 'selves' Popper seems to advance a socialistic type of a theory. He says that with an inborn interest in the human face, people around (parents) there is the beginning of one's learning to be a self. This 'interest' leading to the 'understanding' of other persons, creates the
consciousness of the self in the child. The child uses the people around as the medium, the mirror in which the child sees the reflection of his own self, other people's consciousness of his self. Thus child gets the idea of his self through an interaction with the people around.

Individuation of the self, Popper holds as the necessary requirement for the evolution of the self. Individuality of a human organism is different from that of a piece of metal. They are 'closed' systems with regards to their material particles, whereas a human being is an 'open' system, as there is the exchange or replacement of material particles. They react to the environment and hence are dynamic processes and yet they are identifiable individuals. The self controlling aspect of the human being corresponds to the biological functioning of the human mind that is the brain or the highly centralised nervous system.

According to Popper a new born baby cannot be called a 'person' in the fullest sense. It is just a developing human body with the capacity to experience pain and pleasure. From this he concludes that our body comes first and then the mind - piloting the ship. Popper holds that our mental integrity and the self identity, is centered in the brain.

Popper accepts the analogy of brain and the computer as far as the biological functioning of mind is concerned, but he points out the helplessness of the computer without the programmer. He maintains that, "the brain is owned by the self, rather than the other way round. The self is almost always active. The activity of selves Popper says as, "the only genuine activity we know. The
active, psycho-physical, is the active programmer to the brain (which is the computer) it is the executive whose instrument is the brain. The mind is, as Plato said, the pilot. It is not as David Hume and William James suggested, the sum total, or the bundle, or the stream of its experiences: this suggests passivity. It is, I suppose, a view that results from passively trying to observe oneself, instead of thinking back and reviewing one's past actions.

"I suggest that these considerations show that the self is not a "pure ego" ... that is a mere subject rather it is incredibly rich. Like a pilot it observes and takes action at the same time. It is acting and suffering, recalling the past and planning and programming the future, expecting and disposing. It contains, in quick succession, or all at once, wishes, plans, hopes, decisions to act, and a vivid consciousness of being an acting self, a centre of action. And it owes this selfhood largely to interaction with other persons, other selves and with world 3".

Locke considered mind as a 'tabula rasa' an empty sheet, empty chamber and maintained that all knowledge is through our experiences in the life-time. Popper not only disagrees with this but also further adds that the large amount of information that we get through our experiences in life, is very small when compared with the inherited potentialities in the ten thousand million neurons of our cerebral cortex, and "some of them (the cortical pyramidal cells) each with "an estimated total of ten thousand" 'synaptic links', as Eccles mentions."
According to Popper, the inborn ability to use the acquired information and knowledge is more important along with the inherited potentialities and knowledge.

World 3 consists of the acquired knowledge and World 2 consists of the psychological (subjective experiences) processes and hence Popper holds that, 'fully conscious intelligent work' is the result of the interaction between the above two Worlds.

According to Popper, one's intellectual grasp of the problem and a conscious solution of that proves one's consciousness. However, empiricists have said of sense-perception as only paradigm of conscious experiences.

As far as the biological functioning of consciousness and the resulting intelligent activity is concerned, Popper argues that: "The evolution of consciousness, and of conscious intelligent effort, and later that of language and of reasoning - and of World 3 - should be considered teleologically, as we consider the evolution of bodily organs as serving certain purposes, and as having evolved under certain selection pressures".  

Popper while arguing for consciousness says that the solution to the routine problems comes unconsciously, it is the problem of non-routine type that demand conscious activity. Further, criticising, selecting, unexpected or new theories need consciousness or are the things to be done consciously. Again, consciousness is very important in the process of taking decisions or choosing an aim, or purpose when there are alternatives to be tried.

For Popper however, consciousness cannot be strictly indentified with self. For the self is continuous whereas
consciousness is interrupted by periods of sleep — the 'unconscious "parts" of the self', without disturbing the continuity of the self. The unconscious parts of the self are very important or play an important role in the unity and continuity of the self. We try to recall what happened in the immediate past — before unconscious part begins — and the things which are in the unconscious are brought at the level of consciousness.

Popper through his biological approach illustrates the unity, continuity and the individuality of the self — all put together, he thinks that, it throws light on the understanding of human consciousness of the self. Popper believes although in animals self-preservation is an instinctive behaviour they are unaware of their death and most important thing is, unlike man they do not have power to reflect and revise critically.

Returning to Popperian three world schema, one observes that world of things that is, of physical objects, is the world 1. The second world consists of our experiences, world 3 consists of theories, which is the product of human mind. A book although is material, belongs to world 3 because its content is the creation of human mind. World 3 objects have a reality and autonomy of their own. In other words world 3 cannot be reduced to world 2 and world 2 in turn to world 1. For instance when we are recalling a picture or a painting, efforts are made to bring the picture before our eyes. We can distinguish between "(a) a real picture, (b) the process of imagining, which involves an effort, and (c) the more or less successful result, that is, the imagined
picture. Clearly, the imagined picture (c) belongs exactly like (b) to the second world rather than to the third ... the imagined picture may be said to be the content of the process of imagining. And therefore is considered to be mental and belongs to world 2.

But contents are parts of thinking process and "one man's thought processes cannot contradict those of another man; or his own thought processes at some other time; but the contents of his thoughts - that is, the statements in themselves, cannot stand in psychological relations: thoughts in the sense of contents or statements in themselves and thoughts in the sense of thought processes belong to two entirely different "worlds".

It is in this sense the books, journals, letters and the theories belong to the third world. The physically non-observable message that is coded in the book, in a theory, is decoded by the reader and is real, in the sense that it can act upon material objects and which can be acted upon by material objects. That changes are brought about not by the physical aspect of the book, but mainly by the information, the message that is conveyed through the theory. The decoding of the message by the reader is a mental process and belongs to world 2 and it is through this world 2, world 1 and world 3 can interact indirectly.

Popper is then a realist believing in the reality of theories, as they are capable of exerting their influence. Again, the third world is autonomous because of "unintended and unforeseen consequences" like the production of prime numbers, square numbers and other things in the third world itself. In other words the third world consists of the inventions of human
mind. Thus, whatever is created by human mind, will have its own laws, and therefore autonomous, and it is this, through which unforeseen consequences are possible.

It is with the help of this world, Popper adopts a biological, evolutionist approach to the mind-body problem. The approach is taken as dealing with both, our subjective states of consciousness and our selves. Mind is understood as, "highly developed bodily organ" contributing to the organism as a whole. Popper explains thus: "... we regard the human mind first of all as an organ that produces objects of the human third world (in the more general sense) and interacts with them. Thus I propose that we look upon the human mind, essentially as the producer of human language, for which our basic aptitudes are inborn; and as the producer of theories, of critical arguments, and many other things such as mistakes, myths, stories, witticisms, tools and works of art".

According to Popper language in first to emerge as it is the basis of the capacity to imagine and to invent and thus, there is the emergence of the third world.

The speech centre, constitutes the physiological basis for the emergence and development of language which is the highest in the hierarchy of control centres. Popper reviving the Cartesian problem of seat of consciousness in the brain, conjectures that the theory might be testable in case of split brains.

Popper says that, men and animals both are conscious that is in general 'consciousness' which can be distinguished from highly organised states of consciousness. Consciousness emerges before
the emergence of language. But the fullest consciousness of ourselves emerge only through the emergence and development of language. That is when we learn that there are other beings similar to ourself, when we are consciously aware of our bodies as extending in space and time and in becoming aware of continuity of our bodies and ourselves irrespective of breaks during sleep.

Language and the objects of the world 3, Popper holds, can account for the emergence of self. Language leads to the production of world 3 and is open of modification through a feedback coming from world 3.

In our intense mental states (for example, the mental state of a person who is engrossed in solving a problem, understanding a theory) the person forgets himself as his mind is engaged, with utmost concentration, in grasping or producing a world 3 object.

It is because of this grasping or producing a world 3 object we best serve the biological purpose. We cannot think of a physical organ responsible for our utmost concentration, responsible for our linguistic development, anticipation, inventiveness except mind. Thus the concept of mind contributing towards the development of organism as ourself seems indispensable.

This theory, as Popper says is an interactionist theory, where there is the psycho-physical interaction. Physical organs interact with each other and also interact with mind. Popper while explaining interactionism, holds that non-physical entities do influence the physical and therefore physical world is not closed.
Popper being an exponent of 'Emergent evolution' says that there can be novel (new things) occurrences in the evolution process. Popper holds that consciousness and mind has evolved in this way. In his psycho-physical interactionism he maintains that, the non-physical entities may influence the physical world. And therefore he is convinced of the fact that the physical world is not causally closed. His view that the physical world is not causally closed has its basis in Darwinism. According to J. Van Rooijen Popper reasons as follows. Popper maintains that mental experiences must have emerged during evolution. According to Popper, Darwin's theory explains the emergence of anything only if it (the emerging thing) makes a difference. This means that, the mental can influence the physical. So Popper concludes that the physical world is not causally closed.

Rooijen says, if Popper's reasoning is correct, then it shows that there is a contradiction in ethology. Ethology is a branch of biology, a biology of behaviour, in which the assumption of interactionism in evolutionary theory is discussed.

Lorenz and Tinbergen, the founders of ethology emphasise scientific attitude and "a strict observance of the epistemological discipline". J. Van Roojan attempts to show that there is no such contradiction between evolutionary process and the assumption that the universe is causally closed. In turn if interactionism is allowed, then it will lead to contradiction between interactionsim and whatever is stated is ethology on the one hand and with biology and other natural sciences on the other.

Roojan says that development of natural sciences took place
only when non-physical entities were left out or thrown out. The
came is true in the case of ethology. But in the later
development of ethology, there is a tendency to consider non-
physical entities as the causes of behaviour. Since, mental
events as private experiences exist and are seen as influencing
the material. Roojan points out, "that we tend to see mental
events as causes or effects of physiological processes". This
he says according to Lorenz, the founder of ethology, "due to the
fact that in daily life we are sometimes more familiar with the
psychological and sometimes with the physiological side of events
out of a chain of events. As an example he mentions that we say
that a severe disappointment causes a heart disorder.
Physiological processes belong to the objective world ... psychological phenomena are observable by introspection and
therefore only accessible to one person. Such phenomena belong to
the subjective world". Secondly, we believe that higher
animals along with human beings have mental experiences. Thirdly,
we believe in individual's enjoying freedom, where mind is
considered as an entity. Roojan explains further, that mental
experiences are seen or taken as adaptations. He says that these
mental experiences are adaptive features, which are to be
considered as secondary properties and they should be understood
as adaptively neutral that is, they make no difference. If the
characteristic that emerges is not because of 'logical
consequences of a structure', then that characteristic can be
called an adaptation. The brown colour of the feathers in many
birds, which may help them to protect themselves against the
predators, can be called an adaptation.

Rooijen points out that "the brown colour of the liver is an example of a case in which it is not justified to use the term adaptation... This brown colour is the logical consequence of the presence of biliary ducts and blood vessels... In a similar way mental experiences may well be a logical secondary (non-adaptive) feature of a structure, which evolved because of adaptive properties. Because it is not correct that only things that make a difference have emerged during evolution there exist no contradiction between evolution and the assumption of a causally closed Universe. Although the assumption of a causally closed Universe is not necessarily correct this conclusion implies that Popper's argument for interactionism does not hold".

Tom Settle reacts to van Rooijen's criticism of Popper. Settle expresses the possibility of Rooijen's misrepresenting Popper's views.

For Roojan, maintains that the introduction of interactionism in ethology will go against the history of science. But Settle points out that Rooijen should note, Popper talks about interactionism in his scientific philosophy and not in ethology. Secondly, it is not necessary that whatever historical method of science is there, it should be followed in future, that is changes are possible in scientific method and its assumptions. Moreover today we see laws of science are not strictly deterministic except in few cases like 'mass effects'. They are all statistical, all probabilistic. Therefore the success of science cannot be attributed to its method alone.

Popper wants to assert that science cannot rule out
interactionism. In Popper we observe interaction between three worlds (the physical, the subjective experiences and the products of mind), which includes the mental physical interactionism. But Popper nowhere explains what is fundamental, in the process of interactionism. Or how the interaction takes place, within a person, that is, how his body and mind interact?

According to Popper World 3 plays a significant role in explaining the interactionism as world 2 is affected dynamically by world 3. Settle comments that, although it is true that world 3 objects are necessary for thought - they can contribute as causes without being dynamic, for example, we see the collapse of social institutions when people stop supporting them.

Settle argues against interactionism, and says that it is not acceptable for certain reasons. According to him, interactionism considers only consciousness and leads to the fragmentation of the mind. The most important reason he says, he cannot accept interactionism lies in the "distaste for the bifurcation of myself into real, parallel (though interacting parts). This is not how I experience myself, nor, I fancy, how anybody else (or any animal) experiences himself or herself... Mind has all the air of a theoretical construct, abstracted from some intriguiny, but fleeting, characteristics of reality".

According to Settle, interactionism is an unsatisfactory theory, as it is not explaining an 'organism' as a whole. He suggests that, in Alfred North Whitehead's philosophy of organism, there is room for the 'specialities' of an organism. Settle favours Whitehead's view, because he feels that, Whitehead
explains what is fundamental than body or mind. Settle puts forth Whitehead's views on what is fundamental as, "that our concepts of both body and mind abstract from a more subtle and unified underlying reality".

Popper as an interactionist is against the view that human beings are 'physico-chemical' machines, a view advanced by materialists. A particular device is called a machine on the basis of how it functions, operates, changes its states and so forth. Something being called a machine is not dependent on the material out of which it is made - whether it is a TV set or a steam engine or a computer. They are all machines - the matter out of which the machine is made is unimportant. Davor Peonjak points out that, "the configuration of the matter would be totally unimportant. There is not only one configuration of matter that can be called a machine, and that everything that is dissimilar to it is not a machine. From the dissimilarity of the TV-set and the steam-engine we can conclude that, let's say, the steam-engine is not a TV-set, but not that it is not a machine. So, the steam engine, refrigerator, TV-set, formula one V-8 engine can be called machines despite the fact that they differ in configuration of matter very much".

If this is true then, it may be questioned, 'why should we use the notion of configuration of matter in deciding whether or not humans are machines'?

Popper will be in worse position if we take into account the possibility of the successful functionalistic computational programmes for describing and explaining human psychology and behaviour. A functionalistic computational programme is not
dependent on how it will be realised. In other words, a program can be realised by various physical devices, having different dissimilar configurations of matter. To the extreme that, their realisability is possible by non-physical things also.

Davor Peonjak upholds the view that man can be compared with a machine. Reacting to Popper's views he says that, "if certain functionalistic programmes were to be successful in describing human psychology and mind, it would follow that programme can be realised by various other devices including physical ones, such as computers. But we call computers machines. If the same programme can be performed by computers and human beings, why shouldn't we say that human beings are machines also? It is said that programmes can be realised by non-physical things also. So even if the human mind is not physical, it can nevertheless be a machine".

Thus, even if we assume mind as non-physical, we can still be for determinism and hold that determination is possible in non-physical spheres. In that case the non-physical entities will be subject to non-physical laws and causal relations. From the non-physicality of mind we cannot establish indeterminism as far as mind and mental events are concerned.

Popper rejects determinism in order to allow his emergentism. A distinction can be made, between emergence in the sense of unpredictability, and emergence as involving basic indeterminism. Herbert Feigl and Paul E. Meehl accept that precise prediction, both physically and logically is impossible, even in classical physics along with the special and general
theories of relativity. But it is insisted that this should not be counted as arguments against determinism. That is, "the familiar examples of the impossibility of predicting the properties of complexes (e.g., chemical compounds; organisms; social groups) on the basis of the properties of their constituent parts or components (e.g. chemical elements, cells, individual persons), do not establish an argument against the possibility of deterministic theories that would explain the properties of the 'organic wholes'. Thus, the emergence of unpredictable events does not lead to the denial of determinism.

Further, evidence suggests that chemistry in principle can be reduced to atomic and quantum physics and biology to 'molecular structure of nucleic acids'. And genuine emergentism is incompatible with such type of reductionism. In the sense, whatever new changes taking place at a higher level cannot be explained with the help of lower level laws. But there are instances of prediction of novel things with the help of laws at the lower level, for example, prediction of new chemical elements along with their properties and their compounds, "predictions of the phenomenal characteristics of organisms on the basis of theory of genes, etc." If the antecedent conditions and the consequences of emergence of novel features, are observed then empirical laws can be framed (statistical laws as far as genetics is concerned) allowing a certain degree of indeterminancy.

In the context of the mind body problem it is the sapience, the sentience and selfhood that is discussed. Among these three it is the 'sapience' - concerning the human intellectual capacities and activities occupy an important place. Popper
rejects psychological determinism as far as the rational (sapience) aspect of the self is concerned.

On the contrary against Popper's psychological indeterminism, it may be said that predications with high degree are possible even in case of non-experimental situations. It may be pointed out, for example the person who has studied logic, rules of syllogisms, when presented an invalid argument, will point out at illicit distribution of the terms. Thus the degree of prediction in human 'rational' behaviour is higher than in other activities and behaviour as in the case of disliking a particular leader, or somebody's falling in love.

Related to the reductionist deterministic view of psychology, is the issue of conflating reasons with causes. That is "a complete causal account, formulated in terms of microlevel (e.g., electrical and chemical events at neural events)" is seen as incompatible with "our intuitive conviction that our beliefs and actions are influenced by reasons". But even on the assumption of 'a valid reason', stating it, hearing another person giving a reason, expression of it in a propositional form, all are events which belong to the causal order. Thus, "when one gives a complete causal account of a physical process at a certain level of analysis, he does not thereby claim in making a meta-claim to "causal completeness", that he has asserted everything true that could properly be asserted about the system. In other words, it is the difference between telling the truth and telling the whole truth".

But Popper is relating and fusing -"Compton's problem" and
"Descartes' problem" and conflates reasons with causes. Compton's question, 'How can I be rational and purposive if determined?' is a philosophical problem. This becomes a crucial problem along with mind-body dichotomy when, "the determining (and determined) events are all set in a purely physicalistic ontology". It is rather bad to say that our 'mind' is determined and it is still worse to say that it is determined by something non-mental.

Popper thus arguing for interactionism, re-admits dualism. However, he rejects mind as a substance, as an entity. Taking an evolutionist approach to the mind-body problem, Popper understands mind as 'highly developed bodily organ' contributing to the organism as a whole. Popper may be called a non-reductionist, as he accepts the existence of mind and self.

NOTES

2. Ibid., pp. 5-6.
3. Ibid., p.11
6. Ibid., p.23.
7. Ibid., p.25.
8. Ibid., p.39.
9. Ibid., p.100.
10. Ibid., p.105. See Popper's Conception of 'Self' in the footnote.
11. Ibid., p.120.
12. Ibid., p.121.
13. Ibid., p.125.
15. Ibid.
16. Ibid., p.147.
17. Ibid., p.150.
18. Ibid., p.151.
20. Ibid., p.91.
21. Ibid., p.89.
22. Ibid., p.91.
24. Ibid., p.402.
28. Ibid., p.527.
29. Ibid., pp.542-543.
30. Ibid., p.543.
31. Ibid.
32. Ibid.
33. Ibid.