CHAPTER II
CONFIRMATION OF SCIENTIFIC APPROACH TO THE WORLD IN VARIOUS MOVEMENTS

Scientism is a challenge today. Language of science and technology are challenges. When we consider science and technology as a way of looking/reviewing HUMAN REALITY, one finds that explanation of human reality is given by means of physical chemical models. Movements like behaviourism, materialism, physicalism, naturalism, mechanistic sciences/mechanism etc., have developed a perspective in which the human mind is translated into brain i.e. the language of mind/self/consciousness is discarded and human behaviour is translated/explained in behavioral language. In other words the 20th century view about human reality is mirrored in/finds an expression in the above mentioned movements. Let us proceed to understand the concept of MAN/HUMAN REALITY vis-a-vis

(1) Behaviourism
(2) Positivism
(3) Physicalism
(4) Materialism
(5) Naturalism
(6) Mechanism

their refutation of metaphysics, languages of mind/consciousness/self/ego etc. and how they want philosophy in verifiable language.

Behaviourism was an attempt to do one thing --- to apply to the experimental study of man the same kind of procedure and the same language of description that many research man had found useful for so many years in
the study of animals lower than man. They believed that man is an animal
different from other animals only in the types of behaviour he displays. 1

J.B. Watson is the founder of behaviourism. Watson (1878-1958) was an
American psychologist who taught at Johns Hopkins University until 1920,
after which he took up a career in advertising ('consumer research')

Watson was an extreme monistic materialist who began by rejecting
introspection as a method of inquiry and then proceeded to deny the very
existence of introspectible states. That is, he denied the existence of all such
'mentalistic' items as thoughts, emotions and beliefs. Watson proposed the
theory that a thought is nothing but an incipient movement of the larynx and an
emotion nothing but an internal pattern of bodily adjustment.

Watson as a psychologist conducted empirical research into the
behaviour of rats, and this somehow led him to form a non empirical general
theory about the nature of the human mind.

What is Behaviour?

There has been a lot of disagreement among behavioral psychologists
about what is to count as behaviour. In ordinary language the word
'behaviour' is not confined to the actions of human beings, nor even the
movements of living things in general. Ordinary language allows us to speak of
the actions and reactions, the workings and the performance, in short the
'behaviour', of all kinds of objects and materials, for example, of acids and
salts and metals; and organs and cells and other parts of living beings, and
volcanoes and glaciers and continental plates; and motor cars and computers
and other machines.

But of course the behaviour of behaviourism is human behaviour, or,
more generally, animal behaviour.
Some of the things which people and other animals do are done with awareness, that is consciously. Of these are voluntary (for instance actions needed to obtain food), some are involuntary (like sneezing) and some can be either (like blinking and coughing).

Other things which people and animals do or undergo are done or undergone unconsciously. For example a normal healthy individual is not usually conscious of the process of digestion.

Voluntary actions are actions which one can oneself suppress. They are generally conscious, though some are habitual and therefore as it were semi-conscious. Reflex actions are involuntary but it is possible to be conscious of some (but not all) of them. For instance one is normally conscious of the fact that one is sneezing.

Unlike voluntary action, reflex action does not necessarily involve the brain. Which of these types of happening do behaviourists mean to refer to, when they speak of behaviour?

Generally speaking, contemporary philosophers appear to take 'behaviour' to refer to all publicly observable ordinary voluntary or involuntary acts of which the subject is normally but not invariably conscious -- events like running, winking, talking, eating, grimacing and so on. Philosophers of a behaviouristic cast of mind do not necessarily deny the existence of consciousness, nor do they deny that there is a difference between voluntary and involuntary actions.

Experimental psychologists, on the other hand, generally include automatic happenings such as digestion and salivation, also all reflex actions, under the term 'behaviour'.

Some experimental psychologists accept behaviourism as a method without committing themselves to any philosophical theories as to the ultimate
nature of the mind. Others, such as Watson are far more radical; these deny, the existence of mental events as such.

One might feel that it cannot be easy for anyone, even a behaviourist, to claim that there are no genuine differences between physiological happenings, like digestion, of which the subject is not normally conscious, and normally cannot control; events like wincing and winking, which the subject or actor might or might not be aware of; and actions such as writing essay and experimenting with rats, which the actor is normally fully conscious of.

However even radical behaviourists in fact can accept that actions are either conscious and voluntary or reflex. Thus according to the followers of B.F. Skinner the difference between so 'called conscious actions' and reflex action is that the latter is the result of evolution and the former the result of environment; in other words, the distinction has nothing to do with internal mental states. Internal mental states are fictions.

J.B. Watson thought that the forcing of this conviction caused most of the storm. It brought out the same type of resistance that appeared when Darwin's "Origin of species" was first published. Human beings do not want to class themselves with other animals. They are willing to admit that they are animals but "Something else in addition". It is this "something else" that causes the trouble. In this "something else" is bound up everything that is classed as religion, the life hereafter, morals, love of children, parents, country, and the like. The raw fact that you, as a psychologist, if you are to remain scientific must describe the behaviour of man in no other terms than those you would use in describing the behaviour of the one you slaughter, drove and still drives many souls away from behaviourism.

Aug., 1930

John B. Watson.
Two opposed points of view are still dominant in American psychological thinking — introspective or subjective psychology, and behaviourism or objective psychology. Until the advent of behaviourism in 1912, introspective psychology completely dominated American University psychological life. The conspicuous leaders or introspective psychology in the first decade of the twentieth century were E.B. Titchener of Cornell and William James of Harvard. The death of James in 1910 and the death of Titchner in 1927 left introspective psychology without emotional leadership. Although Titchner's psychology differed in many points from that of William James, their fundamental assumptions were the same. In the first place, both were of German origin. In the second place, and of more importance, both claimed that consciousness is the subject matter of psychology.

Behaviourism on the contrary, holds that the subject matter of human psychology is the behaviour of the human being. Behaviourism claims that consciousness is neither a definite nor a usable concept. The behaviourist, who has been trained always as an experimentalist, holds, far there, that belief in the existence of consciousness goes back to the ancient days of superstition and magic. The great mass of the people even today has not yet progressed very far away from savagery, it wants to believe in magic. The savage believes that incantations can bring rain, good crops, good hunting, that an unfriendly voodoo doctor can bring disaster to a person or to a whole tribe; that an enemy who has obtained a nail paring or a lock of your hair can cast a harmful spell over you and control your actions. There is always interest and news in magic. Almost every era has its new magic, black or white, and its new magician. Moses had his magic; he smote the rock and water gushed out. Christ had his magic: he turned water into wine and raised the dead to life. Carve had his magic word formula. Mrs Eddy had a similar one. Magic lives.
forever. As time goes on, all these critically undigested, innumerably told tales get woven into the folk lore of the people. Folk lore in turn gets organized into religions. Religions get caught up into political and economic network of the country. Then they are used as tools. The public is forced to accept all of the old wives tales, and it passes them on as gospel to its children’s children.

The extent to which most of us are shot through which a savage background is almost unbelievable. Few of us escape it. Not even a college education seems to correct it. If anything, it seems to strengthen it, since the colleges themselves are filled with instructors who have the same background. Some of our greatest biologists, physicists, and chemists, when outside of their Laboratories, fall back upon folk lore which has become crystalized into religious concepts. These concepts these heritages of a timid savage past have made the emergence and growth of scientific psychology extremely difficult.

One example of such a religious concept is that every individual has a soul which is separate and distinct from the body. This soul is really a part of a supreme being. This ancient view led to the philosophical platform called "dualism". This dogma has been present in human psychology from earliest antiquity. No one has ever touched a soul, or seen one in a test-tube, or has in any way come into relationship with it as he has with the other objects of his daily experience. Nevertheless, to doubt its existence is the become a heretic and once might possibly even have led to the loss of one’s head. Even today the man holding a public position dare not question it.

With the development of the physical sciences which come with the renaissance, a certain release from this stifling soul cloud was obtained. A man could think of astronomy, of the celestial bodies and their motions, of gravitation and the like, without involving soul. Although the early scientists were as a rule devout christians, nevertheless they began to leave soul out of
their test tubes. Psychology and philosophy, however, in dealing as they thought with non-material objects, found it difficult to escape the language of the church, and hence the concept of mind or soul as distinct from the body came down almost unchanged in essence to the latter part of the nineteenth century. Wundt, the real father of experimental psychology, unquestionably wanted in 1879 a scientific psychology. He grew up in the midst of a dualistic philosophy of the most pronounced type. He could not see his way clear to a solution of the mind-body problem. His psychology, which has reigned supreme to the present day, is necessarily a compromise. He substituted the term consciousness for the term soul. Consciousness is not quite so unobservable as soul. We observe it by peeking in suddenly and catching it unawares as it were (introspection).

To show how unscientific is the main concept behind this great German-American school of psychology, look for a moment at William James' definition of psychology. "Psychology is the description and explanation of states of consciousness as such". Starting with a definition which assumes what he starts out to prove, he escapes his difficulty by an argumentum ad hominem. Consciousness - Oh, yes, everybody must know what this "consciousness" is. When we have a sensation of red, a perception, a thought, when we will to do something, or when we purpose to do something, or when we desire to do something, we are being conscious.

All other introspectionists are equally illogical. In other words, they do not tell us what consciousness is, but merely begin to put things into it by assumption, and then when they come to analyze consciousness, naturally they find in it just what they put into it. Consequently, in the analyses of consciousness made by certain of the psychologists you find such elements as sensations and their ghosts, the images. With others you find not only
sensations but so-called affective elements, in still others you find such elements as will the so-called conative element in consciousness. With some psychologists you find many hundreds of sensations of a certain type; others maintain that only a few of that type exist. And so it goes. Literally hundreds of thousands of printed pages have been published on the minute analysis of this intangible something called "consciousness". And how do we begin work upon it? Not by analysing it as we would a chemical compound, or the way a plant grows. No, those things are material things. This thing we call consciousness can be analyzed only by introspection -- a looking in on what takes place inside of us.

As a result of this major assumption that there is such a thing as consciousness and that we can analyze it by introspection, we find as many analyses as there are individual psychologists. There is no way of experimentally attaching and solving psychological problems and standardizing methods.

In 1912 the objective psychologists or behaviourists reached the conclusion that they could no longer be content to work with wundt's formulations. They felt that 30 odd barren years since the establishment of wundt's laboratory had proved conclusively that the so-called introspective psychology of Germany was founded upon wrong hypothesis that no psychology which included the religious mind-body problem could ever arrive at verifiable conclusions. They decided either to give up psychology or else to make it a natural science. They saw their brother scientists making progress in medicine, in chemistry, in physics. Every new discovery in those fields was of prime importance; every new element isolated in one Laboratory could be isolated in some other laboratory; each new element was immediately taken up in the wrap and woof of science as a whole. One need only mention wireless,
radium, insulin, thyroxin, to verify this elements so isolated and methods so formulated immediately began to function in human achievement.

In his first efforts to get uniformity in subject matter and in methods the behaviour rist began his own formulation of the problem of psychology by sweeping aside all medieval conceptions. He dropped from his scientific vocabulary all subjective terms such as sensation, preception, image, desire, purpose & even thinking and emotion as they were subjectively defined.

The behaviourist asks: Why don't we make what we can observe the real field of psychology? Let us limit ourselves to things that can be observed, and formulated laws concerning only those things. Now what can we observe? We can observe behaviour - what the organism does or says. And let us point out at once: that saying is doing -- that is, behaving. Speaking overtly or to ourselves (thinking) is just as objective a type of behaviour as base ball.

The rule, or measuring rod, which the behaviourist puts in front of him always is: can I describe this bit of behaviour I see in terms of "Stimulus and response"? By stimulus we mean any object in the general environment or any change in the tissues, themselves due to the physiological condition of the animal, such as the change we get when we keep an animal from sex activity, when we keep it from feeding, when we keep it from building a nest. By response we mean anything the animal does—such as turning toward or away from a light, jumping at a sound; and more highly organized activities such as building a skyscraper, drawing plans, having babies, writing books, and the like.

What do the behaviourists mean by stimulus? The behaviourist answer will be as follows. If I suddenly flash a strong light in your eye, your pupil will contract rapidly. If I were suddenly to shut off all light in the room in which you are sitting, the pupil would begin to widen. If a pistol shot were suddenly fired behind you, you would jump and possibly turn your head around. If
hydrogen sulphide were suddenly released in your sitting room yet you would begin to hold your nose and possibly even seek to leave the room. If I suddenly made the room very warm, you would begin to unbutton your coat and perspire. If I suddenly made it cold, another response would take place.

Again, on the inside of us we have an equally large realm in which stimuli can exert their effect. For example, just before dinner the muscles of your stomach begin to contract and expand rhythmically because of the absence of food. As soon as food is eaten contractions cease. By swallowing a small ballon and attaching it to a recording instrument we can easily register the response of the stomach to lack of food and note the lack of response when food is present. In the male, at my rate, the pressure of certain fluids (semen) may lead to sex activity. In the case of the female possibly the presence of certain chemical bodies can lead in similar way to overt sex behaviour. The muscles of our arms and legs and trunk are not only subject to stimuli coming from the blood; they are also stimulated by their own responses - that is, the muscle is under constant tension; any increase in that tension, as when a movement is made, gives rise to a stimulus which leads to another response in that same muscle or in one distant part of the body; any decrease in that tension, as when the muscle is relaxed, similarly gives rise to a stimulus.

So we see that the organism is constantly assailed by stimuli -- which come through the eye, the ear, the nose and the mouth -- the so-called objects of our environment; at the same time the inside of our body is likewise assailed at every movement by stimuli arising from changes in the tissues themselves. Don’t get the idea, please that the inside of your body is different from or any more mysterious than the outside of your body.

Through the process of evolution human beings have put on sense organs -- specialized areas where special types of stimuli are most effective --
such as the eye, the ear, the nose, the tongue, the skin and semi-circular canals. To these must be added the whole muscular system, both the striped muscles (for example, the large red muscles of arms, legs and trunks) and the unstriped muscles (those, for example, which make up the hollow tubelike structures of the stomach and intestines and blood vessels). The muscles are thus not only organs or response -- they are sense organs as well. Many of our most intimate and personal reactions are due to stimuli set up tissue changes in our striped muscles and in our viscera.

One of the problems of behaviourism is what might be called the ever-increasing range of stimuli to which an individual responds. Indeed so marked is this that you might be tempted at first sight to doubt the formulation we gave above, namely, that response can be predicted. If you will watch the growth and development of behaviour in the human being, you will find that while a great many stimuli will produce a response in the newborn, many other stimuli will not. At any rate they do not call out the same response they later call out. For example you don't get very far by showing a new-born infant a crayon, a piece of paper, or the printed score of a Beethoven symphony. In other words, habit formation has to come in before certain stimuli can become effective.

Behaviourists have brought out the fact that from birth to death the organism is being assailed by stimuli on the outside of the body and by stimuli arising in the body itself. Now the organism does something when it is assailed by stimuli. It responds, it moves. The response may be so slight that it can be observed only by the use of instruments. The response may confine itself merely to a change in respiration, or to an increase or decrease in blood pressure. It may call out merely a movement of the eye. The more commonly
observed responses, however, are movements of the whole body, movements of the arm, leg, trunk, or combinations of all the moving parts.

Usually the response that the organism makes to stimulus brings about an adjustment, though not always. By an adjustment we mean merely that the organism by moving so alters its physiological state that the stimulus no longer arouses reaction. This may sound a bit complicated, but examples will clear it up. If I am hungry, stomach contractions begin to drive me ceaselessly to and fro. If, in these restless seeking movements, I spy apples on a tree, I immediately climb the tree and pluck the apples and begin to eat. When surfeited, the stomach contractions cease. Although there are apples still hanging round about me, I no longer pluck and eat them. Again, the cold air stimulates me. I move around about until I am out of the wind. In the open I may even dig a hole. Having escaped the wind, it no longer stimulates me to further action. Under sex excitement the male may go to any length to capture a willing female. Once sex activity has been completed the restless seeking movements disappear. The female no longer stimulates the male to sex activity.

The behaviourists has often been criticized for this emphasis upon response. Some psychologists seem to have the notion that the behaviourist is interested only in the recording of minute muscular responses. Nothing could be further from the truth. Let me emphasize again that the behaviourist is primarily interested in the behaviour of the whole man. From morning to night he watches him perform his daily round of duties. If it is brick laying, he would like to measure the number of bricks he can lay under different conditions, how long he can go without dropping from fatigue, how long it takes him to learn his trade, whether we can improve his or get him to do the same amount of work in a less period of time. In other words, the response the behaviourist is,
interested in is the commonsense answer to the question "what is he doing and why is he doing it". Surely with this as a general statement, no one can distort the behaviourists platform to such an extent that it can be claimed that the behaviourist is merely a muscle physiologist.

The behaviourist claims that there is a response to every effective stimulus and the response is immediate. By effective stimulus we mean that it must be strong enough to overcome the normal resistance to the passage of the sensory impulse from sense organs to muscles. Don't get confused at this point by what the psychologist and the psycho-analyst sometimes tell you. If you read their statements, you are likely to believe that the stimulus can be applied today and produce its effect may be the next day, may be within the next few months, or years. The behaviourist doesn't believe in any such mythological conception.

The two commonsense classifications of response are "external" and "internal" -- or possibly the terms "overt" (explicit) and "implicit" are better. By external or overt responses we mean the ordinary doings of the human being: he stoops to pick up a tennis ball, he writes a letter, he enters an automobile and starts driving, he digs a hole in the ground, he sits down to write a lecture, or dances, or flirts with a woman. We do not need instruments to make these observations. On the other hand, responses may be wholly confined to the muscular and glandular systems inside the body. A child or hungry adult may be standing stock still in front of a window filled with pastry, your first exclamation may be "He isn't doing anything" or "He is just looking at the pastry". An instrument would show that his salivary glands are pouring out secretions, that his stomach is rhythmically contracting and expanding, and that marked changes in blood pressure are taking place - that the endocrine glands are pouring substances into the blood. The internal or implicit responses
are difficult to observe, not because they are inherently different from the external or overt responses, but merely because they are hidden from the eye.

Another general classification is that of learned and unlearned responses. I brought out the fact above that the range of stimuli to which we react is ever increasing. The behaviourist has found by his study that most of the things we see the adult doing are really learned. We used to think that a lot of them were instinctive, that is "unlearned". But we are now almost at the point of throwing away the word "instinct". Still there are a lot of things we do that we do not have to learn - to perspire, the breathe, to have our heart beat, to have digestion take place, to have our eyes, turn toward a source of light to have our pupils contract, to show a fear response when a loud sound is given let us keep as our second classification then "Learned responses", and make it include all of our complicated habits and all of our conditioned responses, and "unlearned" responses, and mean by that all of the things that we do in earliest infancy before the processes of conditioning and habit formation get the upper hand.

Another purely logical way to classify responses is to designate them by the sense organ which initiates them. We would thus have a visual unlearned response -- for example, the turning of the eye of the youngster at birth toward a source of light. Contrast this with a visual learned response, the response for example, to a printed score of music or a word. Again, we could have a kinaesthetic. Unlearned response when the infant reacts by crying to a long sustained twisted position of the arm. We could have a kinaesthetic learned response when we manipulate a delicate object in the dark or, for example, tread a tortuous maze. Again, we can have a visual unlearned response as, for example, when stomach contractions due to the absence of food in the 3 day old infant will produce crying. Contrast this with learned or visceral conditioned
response where the sight of pastry in a baker's window will cause the mouth of the hungry schoolboy to water. This discussion of stimulus and response shows what material we have to work with in behaviourist psychology and why behaviouristic psychology has as its goal to be able, given the stimulus, to predict the response - or, seeing the reaction take place to state what the stimulus is that has called out the reaction.

One may ask an explanation of mental traits whether they are inhereted or not. When it comes to the question of inheritance everyone admits this about bones and tendons and muscles -- "now how about mental traits? Does the behaviourist mean to say that great talent is not inherited ? That criminal tendencies are not inherited ? Surely we can prove that these things can be inhereted ". This was the older idea, the idea which grew up before we knew as much about what early shaping throughout infant life will do as we know now. The question is often put in specific form : "Look at the musicians who are sons of musicians : look at wisely smith, the son of the great economist, John Smith -- surely a chip off the old block if ever there was one. The behaviourist recognizes no such things as mental traits dispositions or tendencies. Hence, for him, there is no use in raising question of the inheritance of talent in its old form.

As J.B. Watson says "I should like to go one step further now and say, " give me a dozen healthy infants, well-formed, and my own specified world to bring them up in and I'll guarantee to take any one at random and train him to become any type of specialist I might select doctor, lawyer, artist, merchant, chief and yes, even beggar -- man and thief, regardless of his talents, penchants, tendencies, abilities, vocations, and race of his ancestors" I am going beyond my facts and I admit it, but so have the advocates of the contrary and they have been doing it for many thousands of years. Please note
that when this experiment is made I am to be allowed to specify the way the children are to be brought up and the type of world they have to live in”.

You will find, then, the behaviourist working like any other scientist. His sole object is to gather facts about behaviour ---- verify his data -- subject them both to logic and to mathematics. (the tools of every scientist). He brings the new-born individual into his experimental nursery and begins to set problems: What is the baby doing now. What is the stimulus that makes him behave this way? He finds that the stimulus of tickling the cheek brings the response of turning the mouth to the side stimulated. The stimulus of the nipple brings out the sucking response. The stimulus of rod placed on the palm of the hand brings closure of the hand and the suspension of the whole body by that hand and arm if the rod is raised stimulating the infant with a rapidly moving shadow across the eye will not produce blinking until the individual is sixty five days of age. Stimulating the infant with an apple or stick of candy or any other object will not call out attempts at reaching until the baby is around 120 days of age. Stimulating a properly brought up infants at any age with snakes, fish, darkness, burning paper, birds, cats, dogs, monkeys will not bring out that type of response which we call "fear" (which to be objective we might call reaction "X") Which is a catching of the breath, a stiffening of the whole body, a turning away of the body from the source of stimulations, a running or crawling away from it.

On the other hand there are just two things which will call out a fear response, namely, a loud sound, and loss of support. Now the behaviourist finds from observing children brought up outside of his nursery that hundreds of these objects will call out a fear response, consequently, the scientific question arises: If at birth only two stimuli will call out fear, how do all these other things ever finally come to call it out? Please note that the question is
not a speculative one. It can be answered by experiments, and the experiments can be reproduced and the same findings can be had in every other laboratory if the original observation is sound. Convince yourself of this by making a simple test.

If you will take a snake, mouse or dog and show it to a baby who has never seen these objects or been frightened in other ways, he begins to manipulate it, poking at this, that or the other part. Do this for ten days until you are logically certain that the child will always go towards the dog and never run away from it (positive reaction) and that it does not call out a fear response at any time. In contrast to this, pick up a steel bar and strike upon it loudly behind the infant's head. Immediately the fear response is called forth. Now try this: At the instant you show him the animal and just as he begins to reach for it strike the steel bar behind his head. Repeat the experiment three or four times. A new and important change is apparent. The animal now calls out the same response as the steel bar, namely a fear response. The behaviourists call this in behaviouristic psychology, the conditioned emotional response -- a form of conditioned reflex.

The above discussion reveals that behaviourism as a philosophical theory is as old as reductive materialism. In his De Corpore Hobbes attempted to interpret all mental states in terms of matter in motion. His is probably the most celebrated theory of this sort. Contemporary discussion of behaviourism, however, starts with the work of J.B. Watson. Watson aimed to establish psychology a science, protesting against what he viewed as the subjectivism of introspectionist psychology. Holding that a truly scientific enterprise seeks prediction and control, Watson maintained that only "objective" methods will enable achievement of these goals. He believed that objectivity in turn requires that different scientists be able to observe the same object and events. States
of consciousness being private, observation of behaviour alone is able to provide the necessary data for scientific psychology. The behaviourism espoused by Watson received powerful support from the dramatic experimental work of Ivan Pavlov. Watson believed that psychology could be reduced to physics -- that psychological phenomena were ultimately nothing more than molecular motions. But the reduction could be achieved only through physiological investigation. Hence, sound physiological theory was, for Watson the door to the promised land.

A behaviourist believes that behaviour is in some way central to the study of human beings. But what is meant by "behaviour"? The question is not as simple as it seems. Suppose "behaviour" is defined following common sense as any movement of an organism. This definition encounters a number of difficulties. First, there are certain behaviourists who wish to restrict the range of movement to which the term "behaviour" applies so as to exclude physiological processes. (Is the heart's pulsation a form of behaviour?). Although Watson's classical formulation of behaviourism embraces such movements B.F. Skinner prefers a more restrictive conception: In the behaviour of organisms Skinner first defines "behavior" as "the action of the organism upon the outside world". His aim was to eliminate physiological processes from the range of phenomena with which the psychologist is properly concerned. Watson and Skinner agree however, that by "behaviour" is meant some sort of movement of the organisms.

The American psychologists B.F. Skinner is a radical behaviourist strongly influenced by the work of J.B. Watson. Like Watson he is by profession an experimental psychologist, and like Watson he has proposed a general philosophical theory about the nature of the mind. 3
Skinner writes 'I do not believe that there is a world of mentation (i.e. mental happenings) or subjective experience .................. thinking is simply behaving and may be analysed as such'.

It looks as if he is saying that he thinks there are no thoughts and believes there are no beliefs.

The reasons he adduces for this difficult position are as follows. It is possible to give causal explanations of the laboratory behaviour of rats and other experimental animals without making any reference to the creatures' feelings and beliefs. Rats' behaviour appears to consist of reflex actions, which can be explained in terms of genetic theory, and of actions which the rats have been trained to do, that is, which they have been induced to perform by external conditions such as pains and rewards. These external conditions can be imposed by a human experimenter, or they might instead just be part of the physical environment. Skinner thinks that human beings too are trained by undergoing the painful or pleasant consequences of their own actions, and indeed says that all human behaviour which is not part of the genetic endowment can ultimately be explained in terms of natural or social punishments and rewards.

Well, but doesn't the rat, or the human being, behave as it does because it associates pleasure (e.g. food) and pain with certain of its own actions, and also because it wants the food and fears the pain, and so on? And surely making associative connections, and wanting, and fearing, are mental events? If the rat made no associations and had no wants or fears it would not learn, would it?

To this and similar objections Skinner has five answers.

All feelings, including fearing and wanting, are bodily, not mental.
Skinner gives no proof of this, apart from the suggestion that the word 'feeling' just means something bodily. Now this is a linguistic argument, and it won't work unless the linguistic facts are as Skinner asserts them to be. But if we look at the linguistic facts there is little evidence that the word 'feeling' invariably makes direct reference to locatable bodily events. For example it is unrealistic to insist that the sense of the word 'feel' in the sentence 'I feel that Skinner has made a mistake here' is such as to involve any direct reference to locatable bodily events.

Skinner second answer is

If internal mental non-bodily feelings did exist, they would be much harder to identify than behaviour.

But this is only a methodological consideration and as such cannot prove that feelings don't exist.

His third answer is

The animal does not make associations: the associations are made by the experimenter.

In the second part of this reply Skinner asserts the existence of the thing whose existence he denies in the first part. For what he here says is that, although when rats or human beings are being experimented on they have no interior mental life, the experimenters themselves do have a mental life so at least some creatures have a mental life, namely experimental psychologist...........................

The fourth answer is

Intentions, purposes and such like mental items are inventions.

Skinner says that it is only under experimental conditions that the causal connections between conditioning and behaviour become obvious. Environmental causes of human behaviour are rarely obvious. For this reason
the concepts of intentions, purpose, emotion and so on have been invented in a vain attempt to explain behaviour, in the same way that the ancient Greeks invented Zeus in a vain attempt to explain thunder.

Well, who invented these notions of intention, emotion etc? And what is it to invent a notion? Isn't the concept of inventing a notion at least as mentalistic and therefore in Skinner's terms at least as vain and superfluous as the notions of intention, emotion and purpose themselves? Try as he might, Skinner seems unable to escape from the mentalistic concepts he derides. Perhaps they are not superfluous after all.

And the fifth answer is

All reference to mental items is pre-scientific (i.e. unscientific).

Using an unexamined notion of the scientific, Skinner says that virtually all thinkers before Newton were unscientific. He then accuses anti-behaviourists of being unscientific in the same way as he believes Aristotle to have been.

He remarks

Aristotle argued that a falling body accelerated because it grew more jubilant as it found itself nearer home. later authorities supposed that a projectile was carried forward by an impetus sometimes called an 'impetuously' All this was eventually abandoned, and to good effect, but the behavioural sciences still appeal to comparable internal states.

In other words, Skinner not only thinks that only scientific reasoning is valid, and not only sees no reason to examine the concept of the scientific, he also thinks that personifying is just as 'unscientific', just as unreasonable, as personifying inanimate objects.

Skinner's most important underpinning philosophical principal, implicit in all his work, is usually assumed rather than blended by him.
A second difficulty immediately arises. Skinner, like most psychologists, discusses "verbal behaviour". By this he means not such behaviour as an organism's movements but rather sounds produced by those movements. To accommodate this extension Skinner adds that "it is often desirable to deal with an effect rather than with the movement itself, as in the production of sounds".

But this modified conception encounters still another difficulty. The movement of one's arm would clearly seem to be an instance of behaviour, but suppose that the arm's motion was the result of a hurricane's effect on that limb. Would a movement produced in this way be behaviour? Or must the movement be involved in something the organism is doing, some action it performs? This qualification seems to throw the net too wide for among the things a human organism does are dreaming, observing, inferring and so on. These do not seem to be behaviour in any obvious sense. They seem to be precisely the sorts of processes behaviourism was originally designed to exclude. (Nonetheless, there are those who regard these states as forms of behaviour) For behaviourism of any variety seeks to restrict the scope of the term "behaviour" to those things which are overt, are observable. Perhaps, then, "behaviour" may be defined as "whatever an organism does, provided it acts upon the outside world". The necessary and sufficient test of whether the movement does "act upon the outside world" being its observability. For if the thing done acts upon the outside world, then it is presumably the sort of thing that can be observed. "Behaviour" in its secondary sense indicates those effects produced by such movements when it happens to be convenient so to regard such effects.

But even this definition encounters difficulties -- which a few illustrations will make clear: Among the things human organisms do and which are observable are moving one's arm, throwing rocks at windows, and writing in
pain. The following locations are perfectly common. "I saw him move his arm". "I noticed him throwing a rock at the window"; "As soon as I saw that he was writing in pain; I called the doctor". (that is, these are actions we are able to observe). Although such reports are frequently made, they may be false. Although his arm moved, he may not have moved it. Although the rock he threw did go through the window, he may not have intended that it should. Although he did lie on the ground, twisting grunting and groaning, he may have been play acting; he may not have been in pain at all. In all three cases the error may depend on the nonoccurrence of something that is, in an obvious sense, not observable. That is whatever distinguishes his moving his arm from his arm moving, an intention to throw the rock through the window, or a pain. We are left with the paradoxical situation that, for example, although one can observe a person writing in pain, one cannot observe the pain without which the report would be false. It seems clear that if behaviour is not to be made trivial at least in relation to the concerns that originally generated the position the criterion of observability must be modified so that it pertains only to those aspects of something done which can be observed. One can observe the movements that are described as "writing", but not the pain. One can observe the motions of the arm and rock but not the intention with which the rock was thrown. One can observe the moving but not the elusive something which makes it a case of his moving his arm. But if this restriction is imposed, behaviourism collapses into what might be called the motionism. Some behaviorist (for example, Paul Ziff) welcome the extended sense implicit in the view that writing in pain is behaviour in the intended sense. Others (for example, B.F. Skinner) try to get round the problem by defining such things as "intentions" and "pains" in terms of functional relations that refer exclusively to antecedent stimulus conditions and motions of bodies. The differences between
behaviourism constructed in these different ways quite significantly influence what philosophers and psychologists take to be their proper object of inquiry.

Current philosophical defences of behaviourism have a common point of origin: the conviction that our ordinary psychological language cannot be correctly analyzed in a way consistent with the defining tenets of cartesian dualism. That is, what we actually mean when we say things like "He is in pain" cannot be explained in cartesian terms. By cartesian dualism is meant the view that (1) there are two causally unrelated substances, mental and physical; (2) Whatever is mental is private; and (3) therefore the only way a person can know that he is in a certain mental state is through observation of his own internal states. It is important to note that behaviourism is only one of many alternatives to cartesian dualism. For example, one might deny that mental states are the sorts of things that one observes about oneself but accept the two-substance view. Behaviourism results only if one denies that there are two substances and maintains that all mental terms can be analyzed in terms of behaviour. Normally, those who are behaviorist in this sense understand the position as implying that all so-called mental states are simply behaviour and are therefore overt and publicly observable. Seemingly private events, such as talking silently to oneself, are reinterpreted as verbal behaviour which it may be difficult but not, in principle, impossible for others to observe. (for example, via laryngeal movements).

Although Gilbert Ryle is willing to have his views labeled "behaviourism", some of the concessions he makes imply that he does not believe that straightforward behavioral analyses can be provided for all our mental terms particularly not for sensation terms like "pain". A.O. Lovejoy, in "paradox of the thinking Behaviourist," sought to prove that "behaviourism......... belongs to that class of theories which become absurd as soon as they become
articulate ". In his argument, directed principally against J.B. Watson's views, 
lovejoy tried to show that the behaviourist does make cognitive claims, for 
example, he may claim to be aware of objects external to himself. But the 
moment the behaviourist makes such claims he involves himself in 
contradiction from which he can extricate himself only by denying that he 
knows anything -- which is an absurd alternative from the behaviourists own 
point of view. Hence, the behaviourist must either contradict himself or lapse 
into absurdity. The alleged contradiction consists in this: Awareness of things 
distant in time and space cannot be identical with movements of certain 
muscles. (Watson maintained that they are identical) or with bodily 
movements of any sort. For no such description of internal bodily events can 
account for the reference made to external objects. In reply to this kind of 
argument, Ryle argues that what is it to be aware of something has to be 
understood dispositionally. An analysis of "A is aware of (or observe) the 
chair" will take the following form: "If a chair is present, and given such and 
such other conditions will behave in such and such ways. " This dispositional 
statement makes the required reference to external objects. But the only 
things not external to the body to which the dispositional statement refers are 
behavioural processes.

C.D. Broad advances two arguments against behaviourism. One of his 
criticisms is that "however completely the behaviour of an external body 
answers to the behaviouristic test for intelligence, it always remains a perfectly 
sensible question to ask: 'Has it really got a mind, or is it merely an 
automation? Here it is assumed that "having a mind" or attributing similar 
psychological predicates to an object cannot have the same meaning as any 
terms referring to actual and possible behaviour. But to this the behaviourist 
can reply that living organisms are in fact automata, although of very
complicated sorts. That is the behaviorist can claim that Broad begs the underlying question which is at issue —— whether human animals are not, after all, merely very complex automata, and whether living organisms in general are not more or less complicated automata. Alternatively, the behaviourist can admit the distinction between automata and living organisms but can insist that broad is wrong in supposing that his question makes sense once certain behaviour is observed. That is, the occurrence of certain behaviour is logically sufficient ground for denying that what is observed is an automation. For example, if you saw an object making Martinis, passing them to other objects, uttering sounds in an animated fashion while pouring some of the liquid through an orifice in the round thing on top of the object, you might take this as conclusive evidence that the object is after all, a living human being. The third response open to a behaviorist is that the essential difference between an automation and a living organism has nothing to do with behaviour but is instead a matter of mode of origin or chemical composition. For example, a living being is born of woman and has calcium compounds constituting its bones, in contrast to the metal automata manufactured by affiliate of the international business Machines corporation.

Broad's second criticism is that perception necessarily involves sensations and that this sensational element cannot be analyzed behaviourally. He supposes, for purpose of argument, that certain molecular changes accompany particular sensations. It is nevertheless true that the sensation and the molecular changes are distinct. For, Broad maintains, we can ask questions about the molecular changes for example, are they show, circular etc? which are non-sensical in the case of sensation like the awareness of red patch. But the behaviorist can reply to this that of course sensations are distinct from molecular changes, but that this is so because sensations are dispositional
properties. Broad considers the possibility and argues that the sort of behaviour that will occur depends on the intentions or wants of the person who perceives. But again the behaviour it has a ready reply. Intentions and wants, he can maintain, are themselves nothing but dispositional properties of organisms.

At this point the critic of behaviourism might argue that it is absurd to suppose that sensations such as pain can be analyzed dispositionally. After all, he might claim, if pain were a behavioral disposition, it would be necessary for a person who is in pain to discover the fact by observing his own behaviour. But the supposition is absurd, as pain is something one is directly aware of. To this, however, the behaviourist can reply as Paul Ziff does, that events which are undoubtedly behavioural, such as moving one’s arm, are events of which the actor is directly aware. It is not necessary for a person to observe that he is moving his arm in order to know that he is. There is no essential difference between behaviour and sensations in precisely that respect to which the critic appeals. However, as was observed earlier, this defense of behaviourism seems to purchase life for the doctrine by so construing "behaviour" as to reintroduce precisely those elements the elimination of which generated behaviourism in the first place that is, states of consciousness or other mental states not accessible to direct observation. Although I can observe someone moving his arm, I cannot observe the aspect of things that involved in his moving it rather than its moving without his moving it.

Positivism :-

The logical positivists thought of themselves continuing a nineteenth-century Viennese empirical tradition, closely linked with British empiricism and culminating in the antimetaphysical, scientifically oriented teachings of Ernst
Mach. In 1907 the mathematician Hans Hahn, the economist Otto Neurath, and the physicist, Philip Frank, all of whom were later to be prominent members of the Vienna circle, came together as an informal group to discuss the philosophy of science. They hoped to give an account of science which would do justice -- as, they thought, Mach did not -- to the central importance of mathematics, logic and theoretical physics, without abandoning Mach's general doctrine that science is, fundamentally, the description of experience. As a solution to their problems, they looked to the "new positivism" of Poincare in attempting to reconcile Mach and Poincare they anticipated the main themes of logical Positivism. 4

In 1922, at the investigation of members of the "Vienna group", Moritz sehlick was invited to Vienna as professor, like Mach before him (1895-1901), in the philosophy of the Inductive sciences. Schlick had been trained as a scientist under Max Planck and had won a name for himself as an interpreter of Einstein's theory of relativity. But he was deeply interested in the classical problems of philosophy, as Mach had not been.

Around Schlick, whose personal and intellectual gifts particularly fitted him to be the leader of a cooperative discussion group, the "Vienna circle" quickly established itself. Its membership included otto Neurath, Fredrich Waismann, Edgar Zilsil, Bila Von Juhos, Felix Kaufmann, Herbert Feigl, Victor Kraft, Philip Frank - although he was by now teaching in Prague Karl Menger, Kurt Godel and Hans Hahn. In 1926 Rudolf carnap was invited to Vienna as instructor in philosophy, and he quickly became a central figure in the circle's discussions; he wrote more freely than the other members of the circle and came to be regarded as the leading exponent of their ideas. Carnap had been trained as a physicist and mathematician at Jena, where he had come under
Frege's influence. Like other members of the circle, however, he derived his principal philosophical ideas from Mach and Russell.

Ludwig Wittgenstein and Karl Popper were not members of the circle but had regular discussions with its members. In particular, Wittgenstein was in close contact with Schlick and Waismann. Wittgenstein's Tractatus Logico-Philosophicus has a profound influence on the deliberations of the circle, where it was interpreted as a development of British empiricism.

The circle ascribed to Wittgenstein the "Verifiability principle" that the meaning of a proposition is identical with the method of verifying it. That is, that a proposition means the set of experiences which are together equivalent to the propositions being true. Wittgenstein they also thought, had shown how an empiricist could give a satisfactory account of mathematics and logic. He had recognized that the propositions of logic and mathematics are tautologies (The logical positivist paid no attention to Wittgenstein's distinction between tautologies and identities). They are independent of experience only because they are empty of content, not because, as classical rationalists had argued, they are truths of higher order than truths based on experience.

In the German speaking countries, the Vienna circle was a small minority group. For the most part, German speaking philosophers were still committed to some variety of "German idealism". Neurath, with his strong socio-political interests, was particularly insistent that the circle should act in the manner of a political party, setting out to destroy traditional metaphysics, which he saw as an instrument of social and political reaction.

In 1920 the significantly named Verein Ernst Mach (Ernst Mach Society) was set up by members of the circle with the vowed object of "propagating and furthering a scientific outlook" and "creating a intellectual instruments of modern empiricism". To welcome Schlick back to Vienna in 1929 from a
visiting professorship at stanford, California, Carnap, Hahn and Neurath prepared a manifesto under the general title Wissenschaftliche Weltanschauung, Der Wiener Kreis ("The scientific world view: The Vienna circle"). This manifesto traced the teachings of the Vienna circle back to such positivists as Hume and Mach, such scientific methodologists as Helmholtz, Poincaré, Duhamel, and Einstein, to logicians from Leibniz to Russell, utilitarian moralists from Epicurus to Mill and to such sociologists as Fewer bach, Marx, Herbert Spencer, and Karl Menger. Significantly absent were only representatives of the "German tradition" -- even, although somewhat unfairly, Kant.

In order to make its conclusions familiar to a wider world, the circle organized a series of congresses. The first of these was held in Prague in 1929 as a section of a mathematical and physical, not a philosophical, congress. It was jointly sponsored by the Ernst Mach Society and the society for empirical philosophy; a Berlin group led by Hans Reichenbach and with such members as Walter Dubislav, Kurt Grelling, and Carl Hempel, which stood close in its general approach to the Vienna circle.

Meanwhile the international affiliations of the circle were increasing in importance. American philosophers like C.W. Morris emphasized the link between logical positivism and American pragmatism Ernest Nagel and W.V. Quine visited Vienna and Prague. In great Britain, logical positivism attracted the interest of such Cambridge -- trained philosophers L. Susan Stebbing and John Wisdom and the Oxford Philosophers Gilbert Ryle and A. J. Ayer, the latter participating for a time in the deliberations of the circle. In France such philosophers of science as Louis Raugier were attracted by logical positivism; as were a group of Neo -- Thomists led by general Vouillemin, who welcomed the positivist critique of idealism. In Scandinavia, where the way had been prepared by the antimetaphysical philosophy of Hagerstrom, a number of
philosophers sympathized with the aims of the logical positivists: mino Kaila Arne Naess, Ake Petzall, and Jorgen Jorgenson were prominent representatives of the international movement centering on logical positivism. The Polish logicians, especially Alfred Tarski, exerted a considerable influence on members of the circle particularly on Carnap. German philosophers, except for Heinrich Scholz of munster and the Berlin group, remained aloof. Undoubtedly the organizational energies the circle did much to bring into being in the 1930's and international community of empiricists; this was largely a consequence of the circle's isolation within the German countries themselves.

Meanwhile the circle was publishing. in 1930 it took over the journal Annalen der philosophic and renamed it Erkenntness. In the period from 1930 to 1940 it served as a "house organ" for members of the Vienna circle and their associates. In addition the circle prepared a series of monographs under the general title veroffentlichungendes Vereines. Ernst Mach (from 1920 to 1934) and Einheits wissens chaft (edited by Neurath from 1934 until 1938).

During the 1930's however, the Vienna circle disintegrated as a group. In 1931 Carnap left vienna for Prague, in that year Feigl went to Iowa and later to Minesota; I lahn died in 1934; in 1936 Carnap went to Chicago and Schlick was shot by a mentally deranged student. The meetings of the circle were discontinued. The Ernst Mach society was formally dissolved in 1930; the publications of the circle could no longer be sold in German speaking countries. Waismann and Neurath left for England; Zilsel and Kaufmann followed Feigh, Carnap, Menger, and Godel to the united states. Erkenntuis moved in 1938 to the Hague, where it took the name journal of unified science; it was discontinued in 1940. Logical positivism, too, disintegrated as a movement, absorbed into international logical empiricism.
In other words narrowly defined, logical positivism was an organised science -- oriented movement centered in Vienna during the 1920's and 1930's, a movement severely critical of metaphysics, theology, and traditional philosophy. Also known as logical empiricism, logical positivism may be more broadly defined as a doctrine born of classical empiricism and nineteenth century positivism and sharpened by an empirical interpretation of the early logical writing of Ludwig Wittgenstien (1889-1951)

In either case, the distant origins of logical positivism lie in the long history of philosophical empirism, the tradition holding that all knowledge must be derived from human experience alone. More particularly, the empiricism of John Locke (1632-1704), George Berkeley (1685-1753), and David Hume (1711-1776), with their cumulatively ever more radical elimination of nonempirical sources of knowledge, served as inspiration for the scientific views of the influential Vienna physicist and theorist of science, Ernst Mach (1836-1916). In addition the positivist movement of the nineteenth century, founded by Auguste Comte (1798-1857), with its intense admiration for natural science, its anticlerical and anti-metaphysical commitments, and its self-conscious programmes for social and religious reform, lay behind not only Mach but also the small group of mathematical, natural, and social scientists who gathered in Vienna as early as 1907 to discuss Mach's views. In 1922 this group was successful in bringing Moritz Schlick (1882-1936) who was scientifically trained under the great German physicist Max Planck (1858-1947) but also keenly interested in philosophical issues, to the chair once held by Mach at the university of Vienna, Schlick quickly drew around him a circle of like minded thinkers, mainly from the sciences, some of whom formed in 1928 the Verein Ernst Mach (the Ernst Mach society). What soon became known as logical positivism was formulated by this group. The Vienna circle, as they
came to be known, issued a "manifesto" in 1929, organized international meetings, and in 1930 took over a journal renamed Erkenntnis, for the advancement of its increasingly sharp position.

The distinctively "logical" character of the radically empiricist vienna circle was derived from the careful study (a line-by-line examination from 1924 to 1926) of wittgenstien's Tractatus Logico - Philosophicus, which had been completed by 1918 and first published in 1921 (in German under the title Logisch -- philosophische Abhandling), just prior to the vienna circle. Wittgenstein was never a member of the circle and was not sympathetic either to its party spirit or to the "grandiloquence" of its pronouncements, but from 1927 to 1929 he engaged in conversations with schlick and other members of the circle, Wittgenstien 's logical doctrine formed the circle's Sharpest weapeon against methaphysics and theology; the characterization of them not merely as false or outmoded, as commute and the classical positivists had claimed, but as strictly "nonsense"

It was from wittgenstein that the Vienna Circle drew its insistence that all meaningful statements are either analytic (and logically certain merely because they are tautologies) or synthetic (and "truth -- functionally" analyzable into basic propositions corresponding to ultimately simple facts). The circle gave its own characteristic interpretation of what qualified as there "atomic facts" : sense - experience. With this interpretation came support for two of the circle's three primary positions (1) the doctrine of the unity of science, Mach's Key project, on the ground that all the sciences can be reduced equally to variously complex ("Molecular") reports on experience, and (2) the doctrine of the valuelessnes of methaphysics, on the ground that metaphysical utterances, by attempting to go "beyond" experience fact to point to simple sense - experiences and thus are devoid of cognitive content.
Both doctrines were incorporated in and defensible by the third, the single most characteristic doctrine enunciated by the logical positivists: The Verification principle of meaning, fashioned in light of Wittgenstein's analysis of the logic of language. The principle itself "the meaning of a proposition is the method of its verification", though not appearing in the Tractatus Logico-philosophicus, was attributed to a remark by Wittgenstein and was first published in the initial volume of Erkenntnis (1930-1931).

Metaphysics of the traditional branches or philosophy, the positivists rejected transcendental metaphysics on the ground that its assertions were meaningless. Since there was no possible way of verifying them in experience. Nothing that we could possibly experience. They argued, would serve to verify such assertions as "The Absolute is beyond time". Therefore, the positivists held, it tells us nothing. The rejection of transcendental metaphysics was not a novelty, Hume had described transcendental metaphysics as "Sophistry and illusion" and has alleged that it makes use of insignificant expressions; Kant and the Neo-Kantians had rejected its claim to be a form of theoretical knowledge Mach had sought to remove all metaphysical elements from science. But whereas earlier critics of metaphysics had generally been content to describe it as empty or useless or unscientific. The logical positivists took over from Wittgenstein's Tractatus the rejection of metaphysics as meaningless. The propositions of metaphysics, they argued, are neither true nor false; they are wholly devoid of significance. It is as nonsensical to deny as to assert that the Absolute is beyond time.

The Meaninglessness of metaphysics: -

Metaphysical statements fail to meet the empiricist's criterion of meaning and are therefore to be designated as meaningless. Carnap
distinguishes two classes of meaningless statements. The first comprises statements that are syntactically well formed but contain meaningless words that is words for which no empirical criterion can be given (It is assumed as a corollary that no conditions of verification can be specified for propositions containing such words). Instances of meaningless expressions are 'the Absolute', 'the unconditioned', 'the truly existent', 'god', 'nothingness', the cause of the world'. Carnap used the following example to illustrate, his explanation of the meaningless ness of such expressions: suppose someone employs the expression 'babical' and affirms that we must divide all things into those that are babical and those that are not. When asked under what conditions he calls a thing babical, he replies that he cannot say, since babicality is a metaphysical property and hence no emperical criterion can be given for it. In such a case, we would say that propositions about babicality are meaningless. Everyone would agree that the word 'babical' ought not to be allowed in scientific statements.

According to Carnap, matters are no different with respect to the word 'god' Indeed, here the situation is even worse, since many metaphysicians cannot even indicate the syntactical status of the word 'god' whether, eg, it is a name of or a predicate. We can then construct the statement -- form 'X is 'god' and to give the meaning of this expression is to specify the empirical characteristics that a thing must have if it is to be called 'god', within the framework of a mythical conception of the world, in which the gods inhabit specific regions and manifest themselves in emprically ascertainable ways (by hurling thunderderbolts, whipping up a storm at sea, and the like ), the word 'god' would still be meaningful. In metaphysics, however, where this term is supposed to signify a non-emirical, transcendental object, it ceases to be meaningful. Carnap's conception, it should be noted, does not establish a case
for atheism. The latter doctrine consists in denying the truth of the statement 'God' exists?. But according to the empiricist criterion of meaning, what is being denied in this instance is not the truth of some proposition but that we have a proposition here at all. Hence in Carnap's view atheism is theoretically just as meaningless doctrine as theism.

The second class of meaningless utterances is made up of expressions which, although meaningful in themselves are combined in ways that violate the rules of syntax. An example is 'Caesar is a prime number' of course it is not these simple cases of meaningless combinations of words that one encounters in metaphysics. But there also exist more complicated cases that are not so obvious, and many examples of this can be cited from the history of philosophy. Usually what is involved is a wrong interpretation of some logical expression as when the expression 'nothing' is taken to designate an object. A properly constructed language would, by its syntactical rules, bar the formation of such absurdities.

Carnap cited a number of examples to show that on the basis of the criterion of meaning various questions that commonly pass as problems of epistemology could be unmarked as pseudo problems. One of these is the problem of the reality of the external world. Suppose we have two geographers, one a realist and one a solipsist. For the realist physical things are not only contents of perception, they also exist beyond perception in themselves'. For the solipsist only his own perception exist and he denies the 'real' existence of an external world. Now suppose further that the two geographers undertake to find out whether there is a certain lake in central Brazil. As empirical investigators they first of all seek to answer the question with the help of the criteria available to them, perhaps by mounting an expedition into the region in question. In the course of their study they will
arrive at a finding that both can agree upon; there will also be no disagreement with respect to the various individual empirical questions -- the geographical location and size of the lake, its height above sea level, and the like. If, however, after exhausting all available empirical scientist but as metaphysicians. Since by assumption all the empirical criteria, one of them then asserts that the lake is not only there and possess the empirically determined properties, but in addition has a reality outside of consciousness, whereas the other denies such a reality, they will no longer be speaking as empirical scientists but as metaphysicians. Since by assumption all the empirical criteria have been exhausted in questions referring to the lake, there is no further procedure by which to settle this difference of opinion. Hence neither the thesis of realism nor that of solipsism can be accepted as meaningful.

If the propositions of metaphysics are meaningless, how does it come about that time after time metaphysical systems are erected and become the object of ostensibly scientific controversies ? Carnap's answer is as follows: Man's intellectual and spiritual activity is not confirmed to science alone, it also encompasses art and religion metaphysical systems are vague mixtures of these three domains. Metaphysicians have a strong need to express their attitude towards life, yet do not possess the capacity to do so in an adequate way through the creation of works of art. At the same time they also have a predilection for working with concepts and frequently seek a kind of religious edification as well. They thus resort to the language of science in which they express improperly their experience of the world. They make no contribution at all to science and only an inadequate one, as compared with the great work of art, to the feeling about life. Metaphysics is the inadequate expression of an attitude towards life.
Metaphysicians are musicians without musical talent, poets without poetic abilities.

But what about the great problems, the 'eternal' riddles', which from time imemorial have aroused the metaphysician's concern ? The answer is : As scientific problems, these 'riddles' simply do not exist. For a problem is constituted by the fact that a proposition is formulated and the task then set of determining whether that proposition is true or false. But if the proposition is devoid of meaning, then this problem bound up with it is a pseudo problem. The reason most philosophers do not grasp this point is because Theoretical problem's are conflated with the practical problems of life. We should not suppose that in answering theoretical questions we have also solved the problems of life. Just as a Euclidean plane is unboundedly infinite and yet does not by far make up the whole of Euclidean space, so too science is capable of being extended without limit and yet does not make up the whole of life. Even if all meaningful questions were answered, we would thereby have contributed very little to the mastery of life. The problems of life must be overcome in life itself outside of science. For example, there is no such thing as philosophical 'problem of death'. What scientific statements there are about death belong to science of biology and not to philosophy. If beyond this there is talk of an 'existential' problem of death, what is referred to is not a theoretical question but the fact, say, that I am deeply affected by the death of my fellow-men and the certainty of my own death. Coping with this problem is a practical matter; no scientific theory regardless of how it is constructed, can contribute anything here.

Philosophical meaninglessness : - In general, the positivists explained when they said of philosophical assertions that they were meaningless they meant
only that they lacked "cognitive meaning". Ethical and metaphysical assertions have emotional associations, this distinguishes them from a mere jumbles of words. Such statements as "god exists" or "stealing is wrong" are on the face of it, very different from a collocation of nonsense syllables. But the fact remains, the positivists argued that such "assertions" do not convey as they purport to do, information about the existence of character of a particular kind of entity. Only science can give us that sort of information.

Not all philosophers, however, have devoted their attention to describing pseudo entities like "the Absolute" or "values" or "the external world". Many of them have been mainly concerned with empirical -- looking concepts like "fact" thing", "property", and "relation". Russell's lectures on logical atomism and wittgenstenien's Tractatus are cases in point.

Wittgenstein suggested, however, that the sections in the Tactatus in which he talked about facts, or attempted to show how propositions can picture facts, must all in the end be rejected as senseless -- as attempts to say what can only be shown. For it is impossible in principle to pass beyond our language in order to discuss what our language talks about. Philosophy is the activity of clarifying it is not a theory.

Schlick carried to its extreme wittgenstenien's Tractatus doctrine that philosophy is an activity. Philosophy, he suggested, consists in the deed of showing in what the meaning of a statement consists; that is philosophy is a silent act of pointing. The ultimate meaning of a proposition cannot consist in other propositions. To clarify, therefore, we are forced in the end to pass beyond proportions to the experience in which their meaning consists. This view won few adherents. It was generally agreed that philosophers could not avoid making the sort of ontological assertions Wittgenstien made in the Tractatus and that it is altogether too paradoxical to suggest that all
propositions about, for example, the relation between facts and language are nonsensical, even if "important "nonsense. Neurath in particular, insisted that nonsense cannot be "important" cannot act as a ladder by which we arrive at understanding as Wittgenstein had said.

Problems of Positivism :- The course taken by the subsequent history of logical positivism was determined by its attempts to solve a set of problems set for it, for the most part, by its reliance on the verifiability principle. The status of that principle was by no means clear for "The meaning of a proposition is the method of its verification" is not a scientific proposition. Should it therefore be rejected as meaningless? Faced with this difficulty, the logical positivists argued that it ought to be read not as a statement but as a proposal, a recommendation that propositions should not be accepted as meaningful unless they are verifiable. But this was an uneasy conclusion. For the positivists had set out to destroy metaphysics; now it appeared that the metaphysician could escape their criticism simply by refusing to accept their recommendations.

Recognition of this difficulty led Carnap to suggest that the verifiability principle is an "explication", a contribution to the "rational reconstruction" of such concepts as metaphysics, science, and meaning, to be justified on the quasi-pragmatic grounds that if we ascribe meaning only to the verifiable we shall be able to distinguish forms of activity which are otherwise likely to be confused with one another. It is not, however, by any means clear in what way the verifiability principle can be involved against a metaphysician who takes as his point of departure that his propositions clearly have a meaning. The most that can be said is that the onus is then on the metaphysician to distinguish his propositions from others which he would certainly have to admit to be meaningless.
A second set of problems hinged on the nature of the entities to which the verifiability principle applies. Since "proposition" had ordinarily been defined as "that which can be either true or false", it seemed odd to suggest that a proposition might be meaningless. Yet it was no less odd to suggest that a sentence --- a set of words -- could be verified, even if there was no doubt that it could be meaningless. Ayer suggested as an alternative the word "statements", and he wrote as if the problems were a purely terminological one. But it is a serious question whether "true", "false", and "meaningless" are alternative descriptions of the same kind of occurrence or whether to describe a sentence as "meaningless" is not tantamount to denying that only a statement has been made, any proposition, put forward. This would have the consequence that we can consider whether a statement is verifiable only after we have settled the question of the meaning of the sentence used to make the statement.

The logical positivists themselves were much more concerned about the fact that the verifiability principle threatened to destroy not only metaphysics but also science. Whereas Mach had been happy to purge the sciences, the logical positivists ordinarily took for granted the substantial truth of contemporary science. Thus it was a matter of vital concern to them when it became apparent that the verifiability principle would rule out as meaningless all scientific laws.

For such laws are, by the nature of the case, not conclusively verifiable; there is no set of experience such that having these experience is equivalent to the truth of a scientific law. Following Ramsey, Schlick suggested that laws should be regarded not as statements but as rules permitting us to pass from one singular statement to another singular statement. In Ryle's phrase they are "inference licenses". Neurath and Carnap objected to this on the ground that
scientific laws are used in science as statements, not as rules. For example, attempts are made to falsify them, and it is absurd to speak of "falsifying a rule". Furthermore, Carnap pointed out, ordinary singular statements are in exactly the same position as laws of nature; there is no set of experiences such that if I have these experiences there must be, for example, a table in the room.

For these and comparable reasons "verifiability" was gradually replaced by "confirmability" or by the rather stronger notion of "testability". Whereas at first the meaning of a proposition had been indentified with the experiences which we would have to have in order to know that the proposition is true, now this was reduced to the much weaker thesis, that a proposition has a meaning only if it is possible to confirm it, that is, to derive true propositions from it. Carnap, in accordance with his "principle of tolerance", was prepared to admit that a language might be constructed in which only verifiable propositions would count as meaningful. He was content to point out that such a language would be less useful for science than a language which admits general laws. But most positivists interested as they were in the actual structure of science, simply replaced the verifiability principle by a confirmability principle.

If, however, the original principle proved to be too strong, the new principle threatened to be too weak. For on the face of it, the new principle admitted meaningful such metaphysical propositions as "Either it is raining or the Absolute is not perfect". Whether the confirmability principle can so be restated as to act as a method of distinguishing between metaphysical statements as meaningless - and scientific statements as meaningful remains a question of controversy.
Materialism: Materialism is the name given to a family of doctrines concerning the nature of the world which give to matter a primary position and accord to mind (or spirit) a secondary dependent reality or even none at all. Extreme materialism asserts that the real world consists of material things, varying in their states and relations, and nothing else.

Philosophers have differed among themselves over what constitutes a body, over what states and relationships a body may enter, and over whether every material thing is a body. Thus, the cardinal tenet of materialism, "Everything that is, is material", covers several different claims.

To accommodate these differences, a material thing can be defined as being made up of parts possessing many physical properties and no other properties. The physical properties are position in space and time, size, shape, duration, mass, velocity, solidity, inertial, electric charge, spin, rigidity, temperature, hardness, and the like. This list is open ended. It is composed of properties that are the object of the science of physics. The questions "what counts as a physical property?" and "what counts as possession of most of the physical properties?" have no determinate answers. In consequence, there are also no determinate answers for the questions "what is a material thing?" and "what does materialism claim?"

Consciousness, purposiveness, aspiration, desire, and the ability to perceive are not considered properties of matter. Materialism differs from panpsychism, the doctrine that every bit of matter is also at least partly spiritual, in that it denies these psychological properties to the world's basic entities. Materialists add that there is no second class of fundamental beings possessing such psychological properties and no others. Therefore, there are no incorporeal soul or spirits, no spiritual principalities or powers, no angels or devils nor demiurges and no gods (if these are conceived as immaterial
entities). Hence, nothing that happens can be attributed to the action of such beings. The second major tenet of materialism is, accordingly, "Everything that can be explained can be explained on the basis of laws involving only the antecedent physical conditions". The differences among materialist over the type of effect material things can have on one another make the second tenet another slogan covering a variety of particular doctrines. Materialists have traditionally been determinists, adding the claim "There is a cause for every event". This claim however, is not strictly entailed by materialism, recently, it has apparently been weakened by the development of quantum theory, and some contemporary materialists are opponents of determinism.

The enduring appeal of materialism arises from its alliance with those sciences which have contributed most to our understanding of the world we live in. Investigations in the physical sciences have a materialist methodology, that is, they attempt to explain a class of phenomena by appeal to physical conditions alone. The claim of materialists is that there is no subject matter which cannot be adequately treated with a materialist methodology. This claim cannot be established by any scientific investigation; it can be established, if at all, only by critical reflection on the whole range of human thought and experience. Early philosophers proceeded dogmatically, aiming to prove the material nature of the world by mere reflection on what must be. Contemporary materialists are much more modest, offering the claim as a speculative but reasonable empirical generalization. Men have continued to embrace materialism in the face of the difficulties with which it is beset because it offers a comprehensive, unified account of the nature of reality which is economical, intelligible, and consistent with the most successful of the sciences.
History of materialism :

Classical period :- Materialism has been a theme in western speculative thought from the earliest recorded period to the present day. Ionian philosophers in the tradition of Thales (sixth century B.C.) attempted to account for the origin and present state of the world by appeal to changes in the state of fundamental substances. Parmenides of Elea (fifth century B.C.) vigorously defended not only a monism of substances but also a monism of entities, maintaining that the world is one, uniform, eternal, homogeneous, indivisible, indestructible, and without any interior void.

These two threads of thought are combined in the true materialism of Leucippus and his pupil Democritus; who flourished at Abdera in the late fifth century B.C. between them they worked at the first clear conception of matter, the first clear restrictions on the kind of natural interactions in which material particles could figure, and the first clear program of explanation by appeal to these material interactions alone. The "Great Diakosmos", a lost work written by one or the other (or both), expounded their position. Their basic idea was that the fundamental stuff of just one kind (matter) and that the fundamental entities were material atoms having the characteristics (except uniqueness) of Parmenides one and moving in an exterior void.

In so far as it can be reconstructed, their doctrine embraced the following thesis.

(1) Nothing exists but atoms and empty space.
(2) Nothing happens by chance (for no reason at all); everything occurs for a reason and of necessity this necessity is natural and mechanical; it excludes teleological necessitation.
(3) Nothing can arise out of nothing, nothing that is can be destroyed.
(4) All changes are new combinations or separations of atoms.
The atoms are infinite in number and endlessly varied in form. They are all of the same stuff. They act on one another only by pressure or collision.

The variety of things is a consequence of the variety in number, size, shape and arrangement of the atoms which compose them.

The atoms have been in confused random motion from all eternity. This is their natural state and requires no explanation. (Some scholars dispute the attribution of random motion of the atoms and credit the "great Diakosmos" with the epicurean doctorine of an eternal fall through infinite space.

The basic mechanism whereby bodies are formed from atoms is the collision of two atoms, setting up a vortex in the vortex motion is communicated from the periphery toward the center. In consequence, heavy atoms move to the center, light ones to the periphery. The vortex continually embraces new atoms which come near it in their random motion, and it thus begins a world.

According to this position, a mechanical account must be given of human sensation. The Leucippus -- Democritus account seems to have been ingenious, speculative, but false. Objects perceptible by sight, hearing, or smell give off effluences, or images, composed of fine, smooth atoms. There are channels in the eyes, ears, and nose along which these effluent atoms pass to collide with the atoms of the soul. Thus, sensation occurs. Differences of color or of pitch are due to varying smoothness or roughness of the incoming image atoms. In touch and taste the size and shape of the atoms on the surface of the perceived object act on soul atoms in the relevant organs.

Sensory qualities (for example, sweetness, bitterness, temperate, color) are thus not qualities of the object perceived; which is a collection of atoms, but the effects of that collection of atoms on us. Here is an early appearance
of the distinction between primary and secondary qualities, a distinction every subsequent materialist has also found it necessary to make.

Empedocles (fifth century B.C.) founded a medical school in Acrogas (Agrigento) in Sicily. His aim was to account, in a naturalistic manner, for the special features of this world, particularly for the organized matter of living creatures. The first appearance of the famous four elements -- earth, air, fire, and water --- is in his theory. Empedocles seems to have believed that each of these elements consisted of a different type of atom. The creation and dissolution of the microscopic objects of this world is brought about by the combination and separation of these atoms by two fundamental forces, love and hate, or harmony and discord.

Under the influence of love and hate the world goes through an endless cycle from complete random separation of elements (the triumph of hate), through gradually increasing order, to a complete, calm, spherical, harmonious union (the triumph of love). Hate then begins to exist itself once more. Disintegration sets in, and ultimately the world returns to the state of complete separation of elements. The present state of the world lies between these two extremes. The existence of planetary systems and the origin of animals are thus explained as the influence of love.

Empedocles can be considered a true materialist only if love and hate are either inherent forces in the elemental atoms or themselves material elements with a cementing or corrosive effect on combinations of the other elements; however, he probably thought of them as blind, powerful gods. The rest of his systems is similarly ambiguous on the one hand, he believed in the transmigration of souls and adhered to some kind of Orphic mystery religion; on the other, he gave a mechanical account of sensation, held that the soul was composed of fiery atoms, and said that the blood around the heart is the
Empedocle's thought thus perpetuated the materialist tradition but not in a rigorous or consistent form.

The misinterpretation of the ethics of Epicurus (342-270 B.C.) has made him the most famous of classical materialists. In his middle age Epicurus came to Athens and founded a school where materialism was taught as the sole foundation of a good life, a life calm, serene and free from superstition.

He adopted the position of the "Great Diakosmos" but gave a modified account of the origin of worlds. There are an infinite number of atoms falling through an infinite space. In one construction of the Epicurean system the heavier, faster atoms occasionally strike the lighter. Slower ones obliquely, giving a slight lateral velocity. In another construction all atoms fall at uniform velocity, and the original deviations from parallel vertical motion are left quite unexplained.

However caused the original lateral deviations result in more collisions and deviations and the establishment of vortexes. From these vortexes ordered arrangements of atoms arise. The number of atoms and the time available are both quite unlimited, so every possible arrangement of atoms must occur at some time or another. This world, with its marvelously organized living bodies, is thus just one of the infinite, inevitable arrangements into which the indestructible atoms must fall.

The only Roman another of note in the tradition of materialism is Lucretius (born 99 B.C.), whose long didactic poem De Rerum Natura gives imaginative sparkle to the metaphysics of Epicurus. Lucretius adopted the second account of the fall of atoms through the void and appealed to some form of voluntary action to explain the original deviations from vertical descent. He thus introduced a nonmechanical source of motion, inconsistent with the remainder of his system. Like Epicurus, Lucretius was motivated by a wish to
free men from the burdens of religious fear. He argued passionately, and at length against the existence of any spiritual soul and for the mortality of man. These beliefs have been explicit features of materialism ever since.

Seventeenth century: From the close of the classical period until the Renaissance the church and Aristotle so dominated western speculation that materialist theories virtually lapsed. The revival of materialism attributable to the work of two seventeenth century philosophers Gassendi and Hobbes, who crystallized the naturalistic and skeptical movements of thought when accompanied the rediscovery of antiquity and the rise of natural science. Their most important forerunners were probably Telesio, Campanella, and Cyrano de Bergerac, all of whom attempted to combine materialistic views in physics with a sensationalist psychology.

Pierre Gassendi (1592-1655), who in the last part of his life taught astronomy at the Royal college in Paris rejected the official Aristotelian philosophy of his time and set about the rehabilitation of Epicureanism. To bring the epicurean system into closer conformity with Christian doctrine, he claimed that the atoms are not eternal but created. They are finite, not infinite, in number and are organized in our particular world by a providential determination of initial conditions.

Gassendi's materialism extended over physics and psychology, undertaking to account for all inanimate changes and for sensation on a materialist basis. He treated the coming into being of particular "things as the accumulation of matter about a seed atom. But his metaphysics was not, strictly speaking, materialistic, for outside the experienced word Gassendi admitted a creative and providential God and an immaterial an immortal intellect in man distinct from his corporeal soul. There are even some lapses in the
physics, too, for gassendi spoke of gravitation as some kind of movement for self-preservation and allowed that growth from seed atoms may be controlled by formative principles other than the natural motions of atoms.

Thomas Hobbes (1588-1679) was much more consistent and uncompromising. In 1629 he discovered euclidean geometry and was captivated by its method. During the years that followed he strove to work out a rational philosophy of nature on the euclidean model. Hobbes's aim was to discover by cunning analyses of experience fundamental principles expressing the true nature of everything. The truth of these principles would be manifest to right reason and could thus serve as axioms from which a comprehensive theory of the nature of the world could be deductively derived.

The resulting system is almost pure materialism. Hobbes hoped to use the new physics as the basis of a final, complete account of reality. From definitions of space and motion he derived the laws of uniform motion. From these, together with a motion of the interaction of bodies, he hoped to proceed to an account of change. Thence to an account of sensible change, thence to a theory of the senses and appetites of men, and finally to his notorious civil philosophy.

No part of the universe is not a body, said Hobbes, and no part of the universe contains no body. Hobbes was a plenist, holding all space to be filled by an intangible material ether if, nothing else. The doctrine followed directly from his definition of a body as anything existing independently of our thought and having volume. Thus Hobbes considered god to be a corporeal spirit difficult to distinguish from that incarnate space, the pervasive ether.

All change in the universe is motion of bodies, and nothing can cause a motion but contact with another moving body. The substance of anything is body, and "incorporeal substance" is therefore a contradiction in terms.
Hobbes thereby disposed of angels, the soul, and the god of theology. Hobbes departed from strict materialism in his introduction of "conatus" and "impetus" (which are not physical properties) into his account of the imitation of motion and measurement of acceleration. Conatus is also appealed to in Hobbes account of human sensation and action. Sensations are motions in a man's body, and changes of sensation are changes of that motion. Sensory qualities are really within the perceiver, but by conatus "phantasm" is projected from the observer onto the observed.

Hobbes was the first to take seriously the problems which language, thought, and logic pose for materialism. He developed a nationalist theory of language and took the subject matter of thought and inference to be phantasms of sense or abstractions from these phantasms. He held for example, that to remember is to perceive and has perceived. But Hobbes did not make clear just what contact Mechanism is at work in mental operations or whether the phantasms involved are genuinely corporeal. Thus in spite of Hobbes's best effort it is doubtful that he developed a fully consistent materialism.

The influence of Gassendi and Hobbes was diminished by the prestige of their brilliant contemporary, Rene Descartes (1596-1650), who accepted a materialist and mechanical account of the inanimate world and the brute creation but insisted that men had immaterial, immortal spirits whose essential nature lay in conscious thought untempered by causal processes. According to Descartes, there are in the world two quite different sorts of things, extended (material) substances and thinking (spiritual) substances, which are mysteriously antitiled in the case of mankind. He thus crystallized the tradition of dualism (the doctrine that there are just two fundamentally different kinds of things), which was until recently materialism's chief rival.
Eighteenth Century: In Epicurus and Lucretius one motive for working out a materialist philosophy was oppositional to religious terror. With Hobbes, and again in eighteenth century France, it was opposition to religious oppression. Further, rapid growth of physiological knowledge on to religion oppression. Further, rapid growth of physiological knowledge gave rise to the hope that a complete doctrine of man in purely physiological terms was possible and so generated a medical materialism which made the path of the metaphysicians smoother. Ever since the time of Democritus Materialist had held that the soul consists of fine particules within a man. In the course of the eighteenth century this suggestion was taken up and amplified, and some attempt was made to give it an experimental basis.

An anonymous manuscript, the *Ame materielle*, written between 1692 and 1704, contains many ingenious explanations of mental function on Democritean lines. Pleasure and pain consists, respectively, of the flow of finer or coarser particles through the channels of the brain. The passions are a matter of the temperature of the heart. Reason consists in the ordering of the soul's fine particles, and the effect of wine in its course through the body is to dislodge some of these fine particles from their proper places. The manuscript is panpsychic in its expression, crediting the atoms with a rudimentary consciousness and will, but it is materialist in substance, for these qualities are not credited with causative functions. Its doctrines were purely hypothetical and as we now know, false. The *Ame materielle* had successors in Dr. Maubec's *principles physiques de la raison et des passions de l'homme* (Paris, 1709), which again gave a materialist vision of man a panpsychic dress and opposed descartes "Thinking substance", and in Denis director's many unsytematic writings, which took a progressively more materialistic turn, Diderot's *Le Rive de D' Alembert* is a striking hypothetical account of heredity.
growth, and the simpler forms of animal behaviour in terms of interior motions of living bodies.

The most famous medical materialist is Julien de la Mettrie (1709-1751), a doctor with a philosophical bent whose radical views obliged him to leave a fashionable practice in Paris and live in Holland and Russia. In L'Homme machine (Leiden, 1748) he presented a view of man as a self-moving machine. After criticizing all views of the soul as spiritual, La Meltrie proceeded to review all the common-sense evidence for the physical nature of mental activity. He cited the effects of bodily needs, aging, and sleep; he pointed to the analogy of the human body to much lower forms. Anticipating Pavlov, he spoke of the mechanical basis of speech and of the possibilities of educating deaf-mutes and anthropoid apes. He explained learning how to perceive and how to make moral judgements by appeal to modifications of the brain. Human action is accounted for by the then new doctrine of the stimulus irritability of muscle's La Mettrie embarrased those who held that the soul is a spiritual unity by observing the continuing function of organs removed from bodies, the muscular activity of dead or decapitated animals, and the ability of a bisected polyp to grow into complete ones. He explained conscious sensation and the mental capacities of which we are introspectively aware by means of a magic-lantern analogy, but this was unsatisfactory, for the status of the images was not made clear. The details of La Mettrie's physiology, depending as they do on supposed movements of nervous filaments are false. However, his program of seeking in neural changes the explanation of mental activity has endured and his claim that appeals to the soul can furnish only pseudo explanations has gained wide support.

Jean cabanis (1757-1808), a French doctor, continued this line of thought and in 1802 published Rapports du physique et du moral de L'homme.
the most notable innovation of which was to treat the brain as analogous with the digestive system, making sensory impressions its aliments and thoughts its product. The great metaphysical materialist of the period is Paul Heinrich Dietrich d'Iolbach (1723-1789), a German nobleman who passed his life in Paris. His work *The Systems de la nature* was published under a false name, "Mirabaud," at "London" (Amsterdam) in 1770. The "Bible of all materialism" is speculative philosophy in the grand style, in it the antireligious motive is again uppermost. Holbach maintained that nothing is outside nature. Nature is an interrupted and causally determined succession of arrangements of matter in motion. Matter has always existed and always been in motion and different worlds are formed from different distributions of matter and motion. Matter is of four basic types (earth, air, fire, and water), and changes in their propositions are responsible for all changes other than spatio temporal ones.

Mechanical causes of the impact type are the only intelligible ones hence the only real ones. Since man is in nature and part of nature, all human actions spring from natural causes. Man's intellectual faculties, thoughts, passions, and will can all be identified with motion hidden within him. In action outward motions are acquired from these internal ones in ways we do not yet understand. Holbach based the intellectual faculties on feeling and treated feeling as a consequence of certain arrangements of matter. Intrapsexed changes are all changes in our internal material state. Thus, in remembering, we renew in ourselves a previous modification. He treated personal characteristics and temperament in terms of a man's internal structure and interpreted so-called free action not as motiveless action (an absurdity) but as action springing from an ultimately unchosen modification, of the brain. Holbach's theory of mind is also interesting because in dealing with wit and genius, it suggested the first behavioural analyses of mental concepts. Not
surprisingly, he held the soul to be mortal. The purity of Holbach's materialism is marred only by his admission of reactions of sympathy, and affinity among material particles, in addition to the primary qualities, gravity and inert force.

The revolution in chemistry which was effected by Joseph Priestly in England and Antoine -- Laurent Lavoisier in France in the 1770's and 1780's was of importance for the later development of materialism, for it established chemistry as a strictly physical science all of whose explanations appeal only to material substances and their natural interactions. Such a chemistry has since been extended to cover the process of life, and the case for materialism has thereby been profoundly strengthened. Priestly is a curious figure in the history of materialism. A thorough going determinist and materialist (he supported Roger Boscovich's concept of matter as points of force), Priestley nevertheless vigorously maintained his belief in christianity. His religious views were far from orthodox, but he did insist that the existence of God and the resurrection of the body are not incompatible with a materialist and determinist position.

Nineteenth century: - Ludwig Buchner, a minor figure, deserves mention as the first to claim explicitly that materialism is a generalization from a posterior discoveries. In Kraftundt staff (1855) he claims that we have discovered (not proved a priori) that there is no force without matter and no matter without force.

There was during this period a continuation of inquiry and speculation on the physiological bases of mental function. Jacob Moleschott, Karl Vogt, and Emil Du Bois Reymond proceeded with the investigation of physiological processes along physicochemical lines. The most important development were scientific ones which all undermined to the barrier between physical systems and living organisms and thus softened the natural resistences to materialistic
theses. In 1828 the synthesis of urea was achieved, and this refuted the idea that biochemistry was in some way special and distinct from chemistry. In 1847, Hermann Helmholtz established the conservation of energy in organic systems, making still less plausible any claims that living and nonliving systems could not possibly be comprehended in one theory. In 1859, Charles Darwin published his origin of species, in 1871 his Descent of Man. T.H. Huxley had produced man's place in Nature in 1863. These three works at last provided a plausible, empirically grounded case for two of the main planks of materialism: the claim that the organization of living things into forms admirably suited for survival and reproduction admits of explanation without appeal to immanent or transcendent purposes and the claim that man is a part and product of the natural world. Since then biologists, physiologists, and pathologists have increasingly taken the truth of medical materialism for granted, couching their explanations in physicochemical terms without questioning the propriety or completeness of successful explanations in this form.

Contemporary materialism: The triumphant progress in the twentieth century of a materialistic biology and biochemistry has almost completely eliminated vitalist notions and supernatural views of life. The situation of earlier ages has been reversed; it now seems implausible to maintain that the vital functions of living organisms are different in kind from chemical (ultimately, physical) processes. In the attempt to demonstrate that something other than matter exists, it is on mind, rather than life, that immaterialists now rely.

But the rise of Cybernetics (the abstract theory of machines) and its applications in computing machinery and objects which simulate some of the performances of living things are beginning to threaten the idea of a special status for mental activity. The gathering and interpretation of information, the
employment of stored information, successful and spectacular problem solving, even analogues of fatigue, overload, and confusion. Hitherto all monopolies of the animate, are now displayed by organizations of matter whose operations can be explained in terms of physical properties alone. And on the other hand, experimental study of the nervous systems of animals and men is showing in ever increasing detail, how artificially induced changes in the electrochemical state of the nervous system issue in changes in the subjects "mental" activity. Displays of emotion; performance in perception and recall and anxiety and tension are being tied down to brain function in this way. Furthermore, many psychologists of this century have become disheartened by the difficulties of investigating hypothetical mental states and have turned to the study of behavior, relying on publicly observable and physical phenomena in their analyses and explanations of human activities. Indeed, there have been three distinct movements of a materialistic stamp in recent philosophizing about minds.

Some logical positivists, led by Rudolf Carnap and Otto Neurath, espoused an epistemic materialism. They held that statements about minds incontestably meant something. The meaning of any statement consisted in those directly testable statements deducible from it (protocol sentences). The protocol sentences must be intersubjectively testable and the only intersubjectively testable, sentences refer to physical proportion of physical entities. Hence those meaningful statements about minds which do not deal with hypothetical constructs must refer to such physical properties and entities, even though we cannot yet give their physical translations. The beginnings of translation into behaviourist terms was offered for some psychological expressions -- for example "is happy" -- by directing attention to the way in which the use of such expressions is taught by pointing to people behaving happily. In this the positivists and anticipated a favourite strategy of
wittgenstien and moved away from complete dependence on their general doctrines of meaning and verification.

The analytic behaviourists, in particular Gilbert Ryle and his followers offered to show that attribution of intention and intelligence, choice, desire, excitement, fear, and so on all are to be understood as attributions of a disposition to behave in a characteristic manner in suitable circumstances, dispositions are held by most thinkers to issue from some standing or recurrent, underlying state, and with these behaviourists the state was assumed to be a state of the body their manifest intention to exercise the spiritual soul places them in the materialist tradition.

Ludwig' Wittgensteint although he disdained the title behaviorist, belongs to the same group. The conditions upon which he insisted in any acceptable analysis of a mental concept require that descriptions of a man's state of mind must make reference only to publicly detectable features of the organism and its behaviour. His many subtle discussions of mental concepts are all attempts to identify that pattern of behaviour whose display would constitute being in a given state of mind. To attribute that state of mind to a man is to describe him as disposed to display the relevant pattern of behaviour. Talk of states and processes of a spiritual soul is according to wittgenstein, not merely false, it is unintelligible. On two key points the analytic behaviorists have not been entirely convincing. First, if mental states are names of particular patterns of behaviour, they cannot cause the behaviour in question; it cannot be said that a man's anger made him shout or that his pride made him stubborn. It is hard to believe expressions like these must be illegitimate. Second, the occurrences of some inner episodes --- after images, pains, flashes of illumination --- resist any plausible dispositional analysis. The mind does seem to be a collection of states, items, or events in addition to a syndrome of dispositions.
The third group of contemporary materialists embraces a theory of mind known as central state physicalism. They held that the mental states, items, or events which cannot be understood dispositionally turn out, as a matter of fact, to be states of the central nervous system presented to itself in an opaque or covert fashion. Some like Paul K. Feyerabend and Hilary Putnam, claim only that this is the most promising line investigation may now take. Others, take U.T. Place, J.J.C. Smart and Herbert Feigl, go further and maintain that any alternative view is already frankly incredible. David M. Armstrong has extended the range of mental concepts which are given a central state analysis to include some not strictly tied to introspection, such as intelligence, the emotions, and the will. He holds that the mind is the cause of the distinctive behaviour of higher animals, and in his view this cause proves to be a neurological one. The argumentation surrounding central state physicalism is not yet concluded. The fate of the doctrine seems to hang on its ability to deal adequately with the peculiarities of introspective knowledge and to clarify the identification of mental with neural states and on the continuing success of physiologists in their efforts to discover neural changes corresponding to every change in consciousness.

**Objections to Materialism**

Materialists doctrines have never lacked critics and detractors, for they require that some of mankind’s more cherished beliefs and hopes be abandoned of the many possible lines of attack. Let us review the more important.

**Theology**

Materialist theses contradict a large number of theological assertions. In a materialist theory there are no necessary beings and so supernatural interventions in the course of nature. In order to defend
materialism on these points one must first show that there is no valid deductive argument for the existence of a necessary being. No mean task this, but one many philosophers now think can be completed. Next, one must deny to religious experience any supernatural significance. Adopting the critique made by skeptical empiricists, one can argue that religious experience presents no good and sufficient reasons for abandoning natural modes of explanation in particular none for abandoning them in favor of hypotheses which face peculiar difficulties when it comes to putting then to the test. Furthermore, the materialist position is strengthened by the promise of continued success in finding concrete natural explanations of religious experience through developments in physiology and psychology.

If these positions can be established, claims to the existence of god and the occurrence of miracles are established neither by argument nor in experience and so must be considered as interpretative hypotheses laid upon the experienced world. The materialist must again urge that in framing hypothesis, as in seeking explanations, there is no sufficient reason for deserting the natural for the supernatural. In such circumstances as these considerations of parsimony exclude all supernatural entities from any reasonable Ontology. Materialists must show there is no reason to believe in survival of bodily death or in reincarnation. Plausible recent arguments have claimed that both doctrines are logically incoherent. These arguments do not impugn the possibility of resurrection, but that is compatible with materialism.

Physics : - Materialism has in the past been assailed for leaving the origin persistence, and motion of the fundamental particles unexplained, for failing to make intelligible that each fundamental interaction has had one result and not another, and for failing to admit the necessity in causal sequences. The reply,
now very widely accepted, is that all claims of explanation must eventually come to a terminus and that to seek a termius beyond contingent truths concerning the items and processes of the world is to go hunting a mare’s nest.

Psychology: almost every distinctively human capacity has been pointed to as showing that a man is more than an assemblage of atoms. In understanding men, we cannot do without the concepts of perception, belief, and intelligence; action, decision, and choice motive drive, and need; feeling, emotion, and mood, temperament and character. We will also need to treat of consciousness and self-consciousness. The task of the materialist is to explain how merely material structures could qualify for description under all these categories. Two basic approaches, the behavioural and the topic neutral, has been adopted in attempting this. Contemporary materialists differ on which strategy is appropriate in particular cases, but they agree that one or the other is appropriate for every aspect of the mind.

Behavioural strategy: The attribution of some of the mental predicates (for example, intelligence, equanimity, or ambition) to an organism is claimed to be in reality the attribution of a disposition to behave in a characteristic way under suitable conditions. The form the behaviour, takes the conditions under which it is manifest, and the organism which behaves are all specifiable in terms with no immaterialist implication. Also the remarkable subtlety and complexity of human behaviour no longer appear to have strong immaterialist implications, for now the development of machines with the ability to duplicate it seems possible. In particular, the self-monitoring features of conscious behaviour can be displayed by material systems.
**Topic-neutral strategy:** For those mental descriptions which resist behavioural treatment (being in pain, seeing a color, feeling depressed) a different claim is made. It is held that to apply such descriptions is to assert that there is within the organism some state which typically arises from a given stimulus and/or typically issues in a characteristic kind of behaviour. Mental predicates of this kind have been called topic-neutral because they do not specify as material or immaterial the nature of the inner state whose causes and/or effects we encounter. To say a man is in pain, the argument runs, does not of itself imply that he has or has not a soul. It implies that he is in a certain state which arises from the state of his sensory system and issues in certain behaviour patterns. When we explore this state we find reason to believe that it is a state of the organism’s central nervous system. If inner states admit of the topic neutral treatment, they, too have no immaterialist implications.

**Inner states:** The hardest part of the materialist programme is to deal with introspective awareness. Consider sensations, a pain has a definite and distasteful felt quality, a color a definite presence to its observer. Neither colors nor pains present themselves in introspection as states of the person typically connected with stimuli and/or responses. The most promising materialist suggestion is that the intrinsic qualities of sensations are in reality purely schematic and enable us only to distinguish one sensation from another. The sameness or difference of inner states but not their nature is given introspectively. If this is so, sensations can very well be states of the central nervous system typically connected with stimulus and/or response, even though we are not aware of this.
This doctrine is strange but by no means clearly false. Inner states notoriously elude direct characterization. Our attempts to describe them proceed by comparison with other sensations directly or ultimately picked out by reference to their stimulus and/or response. For example, we describe smells as of cinnamon or of rotten eggs (stimulus) and as appetising or nauseating (response); we speak of pains as jabbing, burning like "pins and needles" as crippling or distracting. Feelings of anger, shame, pride, and fear are all described in terms of body temperature. Many common descriptions of our inner states are in terms of the behaviour they dispose us to display. "I could have jumped over the moon", "I could have bitten off my tongue", "You could have knocked me down with a feather", "I was ready to give up". All these ways of talking fit the suggested account of inner states.

A somewhat parallel claim is made concerning inner awareness of mental states which are not sensations. For example, nonsensory knowledge of my intention to go swimming is held to be direct knowledge of the causal properties of some inner state. It is true that an intention has no physical properties, but the causal character of anything whatsoever has no physical properties. Thus the inner state known when I know of my intention to go swimming may be a state of the body. If the behavioural and topic-neutral approaches to mental concepts are jointly adequate, it does not follow that men are exclusively material, only that they may be. To establish that men are material, it would have to be shown by empirical investigation that there were bodily states with the right physicochemical causal properties to account for all human capacities.

Parapsychology: Paranormal phenomena are a serious embarrassment to materialism; the evidence amassed in the investigation of S.G. Soal and L.L.
Vasiliev, to name just two, cannot reasonably be ignored. At some times some people have access to information in ways not explicable within current scientific theory. A fortiori, these phenomena are not explicable within physics alone. It is not merely that the faculties dubbed "telepathy" or "clairvoyance" cannot yet be accommodated but that they seem to be positively excluded by our present understanding of the physical world. The same can be said of the very striking but less well controlled facts of trance mediums.

Although paranormal phenomena cannot be discounted, the spiritual constructions commonly put on them are altogether too hasty. Some revisions of scientific theory will be necessary, but it is not at all clear that we must credit the paranormally gifted with extraordinary souls. Capable of magic performances which "explain" this or that striking event.

There are two other avenues open. The first takes the paranormal phenomena to be indicative of some property of the fundamental physical particles undetected or even undetectable in studies of simpler systems that the human being unhappily, a postulated property of particles which shows itself only in the cognitive functions of immensely complex organisms is both implausible and apparently incapable of independent investigation. And to claim that such a property is a physical property, although it plays no part in any normal physical explanations, is to win a materialist victory by a hollow verbal maneuver.

The second line of approach, to consider paranormal phenomena to be consequences of the complexity of the physical structures involved, is more promising. To admit that paranormal capacities cannot be predicted to arise from concatenation of physical particles is not to admit that ghosts come into play at a certain level of complexity. For instance, even before we could explain the macroscopic phenomena of ferromagnetism as arising from
juxtaposition of molecular magnets, it was not reasonable to suppose that "immaterial magnetism" was at work. The suggestion that "resonances" among complex systems could explain extrasensory perception has been made by Ninian Marshal. His speculations are most plausible in the cases of information passing from mind to mind without intermediary. However, clairvoyant successes (guessing what color light is on inside a box when nobody knows) and trance medium reports of the dead involve action at a distance without medium in both temporal directions. It is not going to be easy to develop the second line of approach in a convincing fashion.

There is no reason to think that these emergent capacities of complex systems will ever be predictable from knowledge of their physical elements. This does not mean that they are not physical emergences or that we could never learn that they were. To deviate into science fiction, we could reasonably claim to know that they were merely physical emergences if it were possible to assemble an electronic machine which demonstrated paranormal powers or to synthesize an organism which grew into something which could demonstrate them. Until then, materialism remains improved.

**Philosophy** :- Forms of materialism that offer knowledge immune from experiential refutation or knowledge of a reality beyond the reach of empirical investigation are vulnerable to empiricist and Kantian, criticisms. But the physicalism which treats its doctrines as contingently true generalizations avoids the charge of purveying degenerate or transcendent hypotheses. There are several other objections of a logical kind which must be faced.

**Argument from self-destruction** :- A popular argument for disposing with materialism is this:
All doctrines concerning the nature of the world are arrived at by inference. Thus a fortiori, materialism is so reached. But if materialism is true, inference is a causally determined process in people's brains, and not a rational process. Materialism is therefore a doctrine arrived at by non rational causal processes. Thus if it is true, there can be no reason to think it so. This argument is invalid that a given process of infering was determined by the structure of a man's brain does not entail that it was an unreasonable inference. Nor does it entail that the man could have no ground for thinking it reasonable. There is nothing in materialism to prevent our learning which inference patterns lead from true premises to largely true conclusions, applying this knowledge to the arguments for materialism, and reasonably (albeit determinedly) concluding that materialism is a worthy position.

Physical and mental properties: - C.D. Broad in *The Mind and Its Place in Nature* formulates many people's reaction to the suggestion that mental events are physical events in a body. About molecular movements is perfectly reasonable to raise the question "Is it swift or slow, straight or circular and so on?" About the awareness, of a red patch it is nonsensical to ask whether it is a swift or slow awareness, a straight or circular awareness and so on. Conversely, it is reasonable to ask about an awareness of a red patch whether it is a clear or a confused awareness; but it is nonsense to ask of a molecular movement whether it is a clear or a confused movement. Thus the attempt to argue that "being a sensation of so and so" and "being a bit of bodily behaviour of such and such a kind " are just two names for the same characteristic is evidently hopeless.

Indeed, this attempt is hopeless, but it is not one a materialist must make. The two "names" that materialist claim to have the same thing are
"subject S having sensation P" and subject S undergoing bodily changes Q". As for P, the sensation S has, this is dealt with by a topic neutral strategy and held to be the convert presentation of bodily changes Q to the person S, who is having the sensation.

Knowledge of physical and mental states: - Another common argument against materialism points to the fact that although the common man can recognize thoughts and feelings and knows what anger, fear, and his intention to go swimming are, he is completely ignorant of the processes in his central nervous system, and so the mental occurrences cannot be identified with any such physical events. Friedrich Paulsen, for example, argued to this effect in chapter 1 of his introduction to philosophy.

Generalized nature of reason: - Keith Gunderson has recently revived an argument of Descartes's to the effect that men are not machines, even Cybernetic machines and therefore not merely material. In all known machines the matching or surpassing of a human intellectual ability is a specific outcome of a specific structure. Each skill is a skill at some special task and no other. But in human beings, intellectual skills are generalized and come in clusters. reasons is a tool for all circumstances. Thus, it is not proven that the man and the machine have a like given skill in consequence of a like inner structure. On the contrary, the reasonable conclusion is that the machine's skill and the man's skill are to be explained in different ways -- That is, man is not any kind of machine. One reply available to materialists is that this argument is premature. The simulation of human performance by material assemblages is in its infancy. There seems no reason to suppose a machine with generalized skills impossible. Another line of reply is also open. To show human abilities
can be matched by a machine is sufficient to establish that men need not be credited with an immaterial side to their nature, but it is not necessary. There may be some irreducible biological laws which distinguish living things from artifacts. But, as was suggested for paranormal phenomena, these could be treated as emergent properties of special kinds of complex material structures and not as the operations of spiritual elements in those structures.

**Intentionality** :- The argument from intentionality can be stated in this form. A peculiarity of many mental states is their essential connection with an object. In intending, I must intend something, and in hoping, I must hope for something. The thing intended or the thing hoped may or may not have any real existence. Thus, materialism cannot be true. The materialist reply to this argument is that hopes or intentions are specified by reference to that which would fulfill them or that which would constitute their exercise. It is important to note that they are specified by way of that which would fulfill them, that is, they are specified by way of things, conditionally claimed to exist. That which perhaps exists does not necessarily exist, but this does not at all mean that if it does, it is something other than a physical thing.

**Logical connections** :- There is also the argument from logical connections between different items: Where an intention and the thing intended exist. They are two different things. Nevertheless, they are logically connected. But any two different physical items are only contingently connected. Hence, mental states cannot be physical items. Materialists urge in rebuttal that this is a consequence of the peculiarly causal character of mental states. Often the only way of identifying a mental state is by reference to the behaviour which it characteristically evokes. If a physical item A is specified as that which evokes
B, then although A is in its own nature only contingently connected with B, the specification of A is logically connected with the specification of B.

**Incorrigible knowledge of mental states:**

It is frequently claimed that introspective knowledge of mental states is logically immune from error. What I believe about my current mental state cannot be false. But all knowledge of physical items is corrigible. Thus mental states cannot be physical states. Materialists differ in reply to this objection. Smart concedes this to be a feature of the logic of reports in which introspective knowledge is expressed but urges that it is inessential and will pass away when materialism is generally embraced. Armstrong takes the bull by the horns and argues that the doctrine of incorrigible introspective knowledge is a mistake.

**Epistemic dualism:** A much more wide-ranging argument has been advanced by some philosophers in the tradition of Kant. The argue that the categories of the physical and the mental are both necessary to a full understanding of human knowledge; that each presupposes favor of the other. If they are right, the very statement of materialism presupposes its own falsehood. To defend themselves against this claim, materialists are therefore bound to develop a complete epistemology. The most critical problem among contemporary materialists is to provide an account of the mind which has some prospect of bring at once adequate and compatible with materialism. Major advances have been made in the direction, but whether they will be fully successful remains to be seen.
Naturalism: in recent usage, is a species of philosophical monism according to which whatever exists or happens is natural in the sense of being susceptible to explanation through methods which, although paradigmatically examplified in the natural sciences, are continuous from domain to domain of objects and events. Hence, naturalism is polemically defined as repudiating the view that there exists or could exist any entities or events which lie, in principle beyond the scope of scientific explanation. In all other respects naturalism is ontologically neutral in that it does not prescribe what specific kinds of entities there must be in the universe or how many distinct kinds of events we must suppose to take place. Accordingly, naturalism is merely compatible with the various forms of materialism it has been confused with: materialism is logically distinct from naturalism and requires independent support unless (as is not the case) materialism is the sole ontology compatible with the ubiquitous employment of scientific method. There is thus room within the naturalistic movement for any variety of otherwise rival ontologies, which explains the philosophical heterogeneity of the group of philosophers who identify themselves as naturalists: it is a methodological rather than an ontological monism to which they indifferently subscribe, a monism leaving them free to be dualists, idealists, materialists, atheists or nonatheists, as the case may be.

The tenets of naturalism: Despite the official toleration of ontological diversity. The typical naturalist is likely to endorse, with whatever individual refinements he might require, most and perhaps all of the following tenets.

(1) The entire knowable universe is composed of natural objects -- that is, objects which come into and pass out of existence in consequence of the
operation of "natural causes". A rock, a cloud, a frog, a human being, are all instances of natural objects, however they may otherwise differ and however important these differences may be. Every natural object exists within the spatio temporal and the causal orders. The universe may in addition contain one or another sort of non-natural object, but have no reason for allowing the existence of nonnatural objects unless they have impact on the observable behaviour of natural objects, for natural objects are the only objects about which we know directly, and it would be only with reference to their perturbations that we might secure indirect knowledge of nonnatural objects, should there be any.

(2) A natural cause is a natural object or an episode in the history of a natural object which brings about a change in some other natural object. Each natural object owes its existence, continuance, and end to the constant operation on it of natural causes, and it is solely with reference to natural causes that we explain changes in the behaviour of natural objects. This may require reference to objects we cannot directly experience, but these will nevertheless still be natural objects, and we need never go outside the system of natural objects for explanations of what takes place within it. Reference to nonnatural objects is never explanatory.

(3) A natural process is any change in a natural objects or system of natural objects which is due to a natural cause or system of natural causes. There are no nonnatural processes.

(4) The natural order or nature is not simply a collection of all the natural objects but a system of all natural processes. Nature is in principle intelligible in all its parts, but it cannot be explained as a whole. For this would presumably require reference to a natural cause, and outside nature as a whole there are no natural causes to be found. Or else it would require reference to a
nonnatural object, but such reference is never explanatory. Nature is self contained as a system with reference to the furnishing of natural explanations, which means not that there will ever necessarily be natural explanations of everything but only that there are no intrinsic limits placed on which natural processes can be naturally explained. Thus, they are all in principle naturally explainable.

(5) Natural method is simply (a) explaining natural processes through indentification of the natural causes responsible for them and (b) testing any given explanation with regard to consequences that must hold if it is true. Truth is merely a matter of consequences, and nature is in each of its parts susceptible to the natural method. The natural method is the way in which one set of natural objects men operate upon the rest of the nature.

(6) Nature could not be both intelligible everywhere and random everywhere, no natural process could be intelligible if in each instance it were produced by dissimilar natural causes or if each natural process were dissimilar to every other. The thesis that nature is intelligible is equivalent to the claim that natural processes are regular. The natural method seeks, accordingly, to establish natural laws. Human beings, as natural objects, are not less subject to natural laws than are other parts of nature, and the natural processes that make up the mental and social life of human beings are equally with the rest of nature subject to the application of the natural method, within the scope of the natural law it seeks to establish.

(7) Whatever may be their official persuasions, all philosophers must function in the natural order as other humans do and, in order to do this successfully, most spontaneously apply the natural method. Farmers and mechanics do not suppose that events have no explanation, neither do policemen or politicians. Whether in human or in nonhuman contexts, men everywhere naturally seek
natural explanations. Recourse is taken to non natural explanation only in moments of despair. But a non natural explanation merely underscores the fact that something cannot be explained or made intelligible at the moment -- it does not provide an alternative kind of explanation or intelligibility. All non natural explanations the result of using non natural methods are in principle replaceable with natural explanations. Nonnaturalists contradict in their practice what they profess in their theories. Naturalists alone hold theories consonant with their practice.

(8) Reason is the consistent application of natural method, and natural science is the purest example of reason. Science reflects while it refines upon the very methods primitively exemplified in common life and practice. Science is thus a way of acting rather than a set of doctrines, and science is, as such, not committed to any specific scheme of intelligibility. Its theories are held to the degree that they serve to explain natural processes, but it is consonant with the commitment to natural method that any theory is perpetually subject to revision or rejection in view of further test. Any scheme of intelligibility may be abandoned without thereby abandoning the principle that nature is intelligible throughout. Science is naturally self-corrective if we think of it as it is as a method to which its own doctrines are unremittingly subjected.

(9) Knowledge of the world at a given time is what science tells us at that time about the world. For the doctrines of science have presumably been achieved through the most rigorous and consecutive application of the natural method. Should there be a conflict between common sense and science, it must be decided in favour of science, in as much as it employs, but more rigorously, the same method that common sense does and cannot therefore, be repudiated without repudiating common sense itself. Conflicts within science are settled through deriving testable consequences from rival theories until a basis for
rational differentiation appears. But because any theory remains infinitely testable, no ultimate certitude attaches to what science holds at any given time. Hence, there is nothing ultimate or eternal about knowledge and, by naturalistic criteria, "P may be false" is compatible with "We know that P", since knowledge is what science says, and what science says may always be rejected in the light of further applications of natural method.

(10) Whatever further or other distinctions there may be between the (so-called) formal and the empirical sciences, they are alike in that the truths of the former no more entail a platonistic ontology than the latter, nor are we, in using algorithms, committed to the existence of numerical entities as nonnatural objects. If the formal sciences are about anything, it will at least not be a realm of timeless numerical essences, and at any rate logic and mathematics are properly appreciated in terms not of subject matter but of function, as instruments for coping with this world rather than as descriptions of another one. A theory of logic is a theory of inquiry, which is reason in action.

(11) To say that outside science there is no knowledge to be had is not to say that it is only through science that men should relate to nature, for there are many ways of experiencing the world. Nevertheless, the only mode of experience which is cognitive is scientific, and no cognitive claims are to be accepted if they are based on other experimental modes. It is not the aim of naturalism to impoverish experience.

(12) Nor is it the aim of naturalism to insist that all natural objects are really reducible to one favoured sort of natural object or that only the objects or the descriptions of objects recognized by the natural sciences are real. All natural objects are equally real and the descriptive vocabulary of the sciences does not exhaust the reality of nature.
(13) The universe at large has no moral character save to the extent that it
sustains human beings among its objects and thus contains entities that have
and pursue values. Men are integral though distinctive components of nature
and, though part of the natural order, are not reducible in any way to other
parts, save in the sense that along with the rest of nature, human beings are
explainable through the methods of the natural sciences. Human institutions
and practices, the modes of experience of men, the goals and values of
individuals and groups, are all natural, and no less so the wheeling of galaxies
and the evolution of species. The natural method alone, not some special
moral intuition, provides the key to dissolving moral disputes, and moral
theories may be treated no differently from scientific theories with respect to
determination of their strength through testable consequences. Naturalism
although otherwise morally neutral, is committed to institutions that permit the
operation of natural method in moral and political decision in which qua
naturalist, the nature list otherwise takes no sides.

(14) Naturalistic philosophy, unlike other philosophies, claims no special
subject matter and uses no special tools. Its method is the neutral method, and
its problems are the problems of men. Positively, then, naturalists will be
engaged in helpful clarification's of problems which arise in the course of
human life rather than with anything otherwise identifiable as a philosophical
problem. Negatively the naturalist is a polemicist, defending naturalism and the
natural method against antinaturalism of all varieties and types.

Criticism :- These tenets, however crudely stated, constitute perhaps the main
components of the naturalistic program. Each is obviously subject to question
and contest. Naturalists have typically used one or another of the theses to
support one under attack and in the polemical literature truly philosophical
arguments in support of the program are rare, naturalists have tended to be philosophers of this or that discipline -- of science, of history, of law, etc. -- in consonance with their view of what philosophy ought to be, and in these spheres of specialized competence, they have made their major contributions, which have been considerable. There nevertheless exists a vacuum between their special inquiries, on the one hand and their polemics, on the other, where philosophy as such as an independent inquiry, is in large degree neglected. Thus Arthur Murphy, an otherwise sympathetic critic, has written that while there is little question of what is the naturalistic position, it remains the case that "The naturalists, who have so much that is good to offer, still lack and need a philosophy" this implies that it is philosophical justification which naturalists have failed to furnish for their views. But of course and consonantly with these views naturalists have characteristically understressed matters of presupposition and the like. For they have argued that no philosophy can get on without presuppositions of one sort or another, that its own presuppositions are minimal, and that if any of its presuppositions should prove dubious, naturalism is at all events committed to an unrelenting self-criticism and is on the alert for unlikely consequences. But this is precisely to insist that naturalistic criteria be used in the adjudication of philosophical issues and in the determination of philosophical doctrine -- and hence to insist that naturalism settle in its own way the issues between naturalism and its rivals. This has led to charge of circularity or disingenuousness. But such criticisms leave the naturalist undismayed, since he insists that he uses no method in philosophy that his critics do not employ in life. But critics have proposed that issues in philosophy are different from issues in life or even science, for that matter, and the continuity of method is exactly what is at issue. And here matters more or less stand, the chief divisions being not so much between naturalists and
antinaturalists --- the latter being chiefly those who have proposed limits to science on ontological grounds and in combat with whom the naturalist has always been most comfortable -- but between competing views of what philosophy is. And here the critics of naturalism are not necessarily antinaturalistic in the comfortable sense of being unhappy with science, in proposing that there are nonnatural entities etc, but rather in the sense of supposing philosophy has its own problems and techniques, to the neglect of which naturalism owes its own neglect at the hands of contemporary nonnaturalist philosophers.

Naturalism flourished in American universities and in the pages of American philosophical journals in the late 1930's and through the 1940's. In the following decade, chiefly in consequence of movements originating in England and on the continent, the vacuum which the polarization of naturalist philosophizing created was increasingly filled with the sorts of philosophical inquiries that the naturalist typically viewed with distaste and suspicion as being remote from the issues of the specialized disciplines and the problems of men. Despite some notable efforts to bring naturalism forward in recent times as a respectable metaphysics and an adequate system of philosophy, the typical professional philosopher appears no longer to find the form in which these issues are presented especially challenging. The dominant contests in contemporary philosophy have been east in other terms and are fought on seemingly different fields. On the other hand, to a great extent many of the fashionable problems are merely disguises for questions which could as easily, and perhaps even more directly, be represented as arising in connection with the claim of the continuity of scientific method.
Mechanism:

Mechanism is sometimes said to be the theory that living organisms and all of their living parts are machines. This is unfortunate for several reasons. There is a tendency, at least in everyday speech, to reserve the term "machine" for artificial devices of a certain sort, especially, as J.J.C. Smart has argued for devices, such as sewing and milking machines, that perform tasks ordinarily performed by people. Organisms are obviously not machines in this sense. There is also a tendency in both the scientific and common Vernacular to regard an object of a certain kind (for example, kind) as a machine -- whether or not it is an artificial device--only if there are certain activities that are regarded as characteristic of all objects answering to the definition of and that can be described and explained solely by the principles of machanics. Thus, for example, at the end of the seventeenth century, it was common to call the solar system a machine and to ascribe to Descartes the view that "brutes"-- but not men, are machines today, most people would be willing to call a pulley system or a bicycle a machine. A living organism, of course, is not a machine in this sense. No matter how we define the science of mechanics -- and the usage of physicists is not decisive.-- mechanical action is to be distinguished from chemical action, which is certainly regarded as characteristic of living organisms.

Finally there is a tendency among some physicists and engineers, especially those engaged in systems design and analysis, to use the terms "machine" and "system" interchangeably. This tendency can be traced to two linguistic facts. Many systems that they call machines are machines in one or both of the above senses; and those systems that are not machines in either of these senses may be "mechanisms". We ordinarily apply the term "mechanism" more broadly than "machine". Radios, watches, telephones, electric switches and the like are, in the vernacular, regularly mechanisms and
only sporadically machines. Since a scientist is unlikely to see any significant theoretical difference between systems that are paradigmatic machines (such as sewing machines) and systems that are paradigmatic mechanisms but not machines (such as telephones), he is willing to extend the term "machine" at least to cover mechanisms. Moreover, there seems to be no significant theoretical difference between the systems that are regularly called mechanisms and any assemblage of material parts that show causal interaction.

In everyday usage a mechanism is a system whose parts are related in the following manner (1) Changes in some of the parts cause changes in most of the others (2) These causally connected changes are regarded as identical with some single activity. For example, when we switch that turns on a lamp is thrown, a bar changes position a spring is stretched, a friction lock is activated, and a gap between two contacts is closed. These changes are all regarded as identical with the single activity of closing the switch. (3) This single activity is of some special interest. It is frequently the function that the mechanism was designed to serve, in this case we often use such expressions as "Switching mechanism" or "starting mechanism". Sometimes, however, we are interested in an activity or process only for other, perhaps scientific reasons. For example, a biologist interested in the segregation of genetic traits is willing to speak of the processes of meiosis as the mechanism of genetic segregation. It is always possible, however, to regard any repetitive pattern of changes as a single activity, whether or not that activity has any special theoretical or practical significance. The relaxation of the requirement of special interest leads to the extension of the term "mechanism" to any system that satisfies conditions (1) and (2).
To summarize these linguistic points; the common language, serving as it does a variety of purposes, draws a distinction between the terms "machine" and "mechanism", and restricts the application of "mechanism" on grounds that are irrelevant to the aims of scientific inquiry. There is no important principle, therefore, that would lead, the scientist to apply the term "machine" to one system and to deny it to another that is like a machine in every relevant respect. Thus the tendency arises to use the terms "system" and "machine" interchangeably. The separation of the concept of a machine from the science of mechanics is aided by the concept of a mechanism, for "mechanism" is connected etymologically with "mechanics" but in ordinary application is not especially associated with mechanical systems.

"Mechanism" as a philosophical theory: If mechanism is interpreted to mean that living organism are machines in the broadest sense (material systems), then the term marks no distinction in the philosophical beliefs of biologists. No biologist believes that organisms are machines in the colloquial sense, but even vitalistic and organismic biologists would agree that organisms are machines in the broader sense and that every organic process is accomplished by means of mechanisms. The important philosophical differences, which will be associated here with the term "mechanism", concern the nature of the principles needed in accounting for the behaviour of living systems.

Two conceptions will be helpful in drawing the distinction between mechanisms and machines. The first is the notion of exemplification of a law in a system or process. One can say, for instance, that an object falling in an evacuated cylinder exemplifies Galileo's law of free fall (\(S = \frac{1}{2}gt^2\)) and that the inheritance of a set of genetic traits may exemplify Mendel's laws of independent assortment and segregation. On the other hand, a football resting
on a table top exemplifies neither law. If we think of a law as of the form "If conditions \( A \) are met, then so are conditions \( B \)" , the law as of the form "If conditions \( A \) are met, then so are conditions \( B \)" the law is then exemplified in every system that meets conditions \( A \), but not necessarily by every system that satisfies the propositional function \( AX > BX \). By this convention, then Newton would have said that everybody exemplifies the law of universal gravitation, but only some special systems, such as a falling body or the solar system, exemplify Galileo's and Kepler's laws. One can also say that the events themselves exemplify a law if they occur in a system that exemplifies the law.

The second conception may be explained as follows. It is, of course, a common place that numerically the same event may fall under conceptually distinct descriptions. A particular dive, executed by a contestant in a competition might, for example, be described as a case of relatively free fall, a swan dive, a graceful performance; or the winning effort. The alternative descriptions here belong to different conceptual schemes, but they apply properly to numerically in the event itself would make some of the descriptions inapplicable: for instance, one sort of difference could make the description "swan dive" inapplicable but leave the rest unchanged. Moreover and this is philosophically of greater interest there is a sense in which the event could be the same and yet some of the descriptions would be inapplicable, for some of the descriptions depend for their applicability on the circumstances of the event's occurrence. Thus, if the dive were not part of a competition, it could not be a winning effort. It will be assumed for the purposes of this article that sufficiently clear criteria are available for the term "same event". This will, in general permit us to say whether \( E_1 \) and \( E_2 \) are numerically the same event, where \( E_1 \) and \( E_2 \) are distinct descriptions with their own criteria of application.
In particular, one or both of the descriptions may be appropriate only under special circumstances of the event's occurrence.

Mechanism may now be defined as the view that every event E, which is describable as a biological event (by any reasonable criterion of "biological"), is numerically the same as the set of events \( (E_1, E_2, \ldots, E_n) \); in which each \( E_1 \) exemplifies no laws that are not also exemplified in non-biological systems ("non-biological" by the same criterion as "biological") stated less formally, mechanism is the view that every biological event is a pattern of non-biological occurrences.

The above definition of mechanism specifies a sense in which biological phenomena might be reducible to the physicochemical. It differs, however, from some standard explications of reducibility. Without examining any of these explications in detail, we may, however, note some of the differences. It is usual to distinguish between conceptual and nomic reduction. Theory \( T_2 \) is conceptually reducible to \( T_1 \) if all the terms in the theoretical Vocabulary of \( T_2 \) may be defined by the terms in \( T_1 \). Our definition leaves reducibility in this sense an open question. It is plausible to suppose that biology contains terms that could not be defined by reference to physics and chemistry particularly if we count psychological phenomena as special cases of the biological, but perhaps even if we do not. Biological theory takes account of the circumstances of an event is occurrence in a way that the physical sciences do not. For example, it is a biological fact that lions hunt Zebras. The biological mechanist ought to insist merely that everything that happens in a given case of Zebra hunting is identical with a sequence of physicochemical events, not that the concept of hunting can be defined in physicochemical events, not. Indeed, it may be the case that "hunting" can be defined only in intentional language.
A theory $T_2$ is nomically reducible to $T_1$ if all the laws of $T_2$ can be deduced from the laws of $T_1$ with the help of co-ordinating definitions and specifications of the structure of $T_2$ systems in the vocabulary of $T_1$. Again a mechanist ought to say that biological phenomena are reducible to the non-biological and still leave open the question of whether nomic reducibility is possible even in principle. It seems a priori that the non biological laws that alone are exemplified in the set of events $(E_1, E_2, \ldots, E_n)$ might have a degree of complexity that would render it impossible to specify their form under the initial and boundary conditions embodied in organic systems.

If one were to say that biological phenomena are, after all not just physicochemical phenomena, he would be correct in any sense that could be important to him; and yet mechanism, even of the form that states that all biological phenomena are physicochemical, is also correct, in any sense that matters to the mechanist. "Is hunting a Zebra a physicochemical process?" is too simple a question. The description "hunting a zebra" belongs to a conceptual scheme that is not physicochemical; however an alternative description of the same event could belong to the physicochemical scheme.

Various philosophers/intellectuals have appreciated these movements; but they say we cannot look upon these explanations provided by these movements as adequate. They are of the opinion and I too agree with them, that the concept of self/Human Reality is not tackled adequately by these movements. In other words though these movements like Positivism, Behaviourism, materialism, Naturalism, mechanism try to explain human reality they have not been in a position to unravel the mistique of human reality/consciousness. They try to tackle this problem in a stimulus - response fashion. i.e., they try to explain human reality in verifiable/objective language. And when this is done emphasis is laid on one side of the human reality. i.e.
they don't give you a wholistic picture of the human reality and therefore I feel that one has to make an attempt to tackle this problem/understand human reality with reference to a combination of something like empirical phenomenological and existential method rather than emphasizing only the objective method because when one does so one realises that one reaches a certain stage wherein the explanation provided illudes us i.e. it does not give us a gestaltic picture of human reality/human consciousness. This subject matter itself is such that using objective method to understand it will never give us a complete picture because the subject matter itself is not totally objective.

References


