2.1 INTRODUCTION

In the previous Chapter, we saw how Descartes' mind-body dualism could be understood as a conceptual distinction between the mind and the body. Descartes' enterprise can be seen as a pioneering attempt in modern philosophy at a naturalistic understanding of the mind within a mechanistic framework and in this sense he laid the philosophical foundations for the development of cognitive science. The received interpretation, however, failed to take note of the highly scientific theses on mind implicit in the works of Descartes. The stuff of dualism is taken to be the existence of the substances of two opposing kinds: an indivisible, unextended res cogitans and a divisible, unthinking res extensa, working like an automaton. The causal interaction between the substances of two opposing natures remained a stumbling block in the scientific study of the mind. The res cogitans is often conceived as a homunculus residing in the brain; consequently, intelligent human behaviour is explained by appealing to the intelligence of the little man in the head. It yielded a circular explanation of the highly complex and peculiarly human cognitive functions. Similarly, within this model, the perceptual capacity of humans is explained by appealing to the perception of the inner man, resulting in an infinite regress. Since the root cause of these maladies lies in the two substance theory, there have been various attempts to remedy them within the framework of materialistic monism. Consequently, there emerged various reductionist theories of mind. In the present chapter we shall examine two such strategies: behaviourism and physicalism. While the former reduces mind to certain behavioural patterns and dispositions, the latter is said to reduce the mental states and processes to certain
2.2 BEHAVIOURISM

Behaviourism roughly is the doctrine that there is no independent ontological status for the mental states and processes over and above the physical behaviour of the organism. It does not mean that it altogether rules out the use of the mental vocabulary, or that the latter is meaningless. Mental predicates can no doubt be employed in psychological explanation. But each such predicate must have at least one description of behaviour to which it bears a logical connection.¹ In other words, the description of the observable physical behaviour provides an operational definition of the mental predicates. That is, the meaning of the mental terms is specified and applied in terms of certain operations namely, the behaviour of the organism. In this section, we shall examine two versions of behaviourism; logical behaviourism which is concerned with the logical analysis of mental terminology and methodological behaviourism which is an empirical doctrine specifying the way psychology is to be practised. Both versions are unanimous in explaining away the internal cognitive states and processes.

2.2.1 Logical behaviourism

Logical behaviourism results from the influence of two powerful philosophical traditions on the philosophy of mind: analytical philosophy and logical positivism. The basic assumption of the analytic philosophy is that most philosophical problems arise due to conceptual or linguistic confusions and they can be solved by an analysis of the language in which these problems are raised. The fundamental idea of logical positivism is that the meaning of a sentence is a matter of observable physical circumstances in which the sentence is verified. A psychological statement, according to logical behaviorism, is to be analysed in terms of the observable behaviours which are the physical circumstances that verify

it. The mental vocabulary subjected to scrutiny and analysis, therefore, consists of the folk psychological terms occurring in ordinary language.

Logical behaviourism is not an ontological doctrine regarding the nature of the mental states and processes. However, it has a certain ontological bias: the mental states have to be understood in terms of the physical and therefore have no ontological autonomy. In line with the Russell-Whitehead system of modern logic where numbers are defined as logical constructs out of sets, the logical behaviourists argue that the mental events and processes are logical constructs out of the actual or the possible physical behavioural events.\(^2\) The ontological bias towards physicalism worked as a platform from where they could react to dualistic metaphysics and the consequent division of science into psychology and physics with different methods and subject matters. Logical behaviourism argues that both the method and the subject matter of psychology and those of physics are the same. Psychology could be reduced to a sub-field of physics like neurology or to physics itself.

The subject matter or the theoretic content of a science is found in the body of its theoretical statements. Physics and psychology have the same subject matter if there is no fundamental difference between statements of physics and those of psychology. The meaning or the content of a statement is determined by the conditions of its verification: the physical circumstances under which the statement turns out to be true and those under which it turns out to be false. The circumstances of its verification are laid down by the physical test sentences. If two statements that differ in formulation are verified under the same physical condition, they have the same meaning and one can be replaced by the other salva varitate. A verified statement asserts that all its physical test sentences have been obtained. Hence it is an abbreviated formulation of the conjunctions of the physical test sentences obtained.\(^3\) Both psychology and


\(^3\) Carl. G. Hempel, "Logical Analysis of Psychology." in NB I. l6-17.
physics have the same subject matter, for the statements of both the sciences are verified by conditions described by physical test sentences. The conditions for the verification of the psychological statement, say 'John feels pain' are described by physical test sentences such as 'John winces', 'John mourns', 'John utters ouch' etc. The physical test sentences in this case detail empirically observable bodily behaviour. The psychological statement, according to the behaviourists, is logically equivalent to the conjunctions of the physical test sentences. It abbreviates the behavioural responses. The psychological terms, being logical constructs out of such behavioural responses, do not refer to any ghostly entities or episodes in the brain. Consequently, the psychophysical problem — how the mental interacts with the physical — is a pseudo-problem.

But the above analysis is contrary to our everyday experience. It is not necessary that a person feeling pain should exhibit all the physical responses that define pain. He may exhibit only a few of them or perhaps none at all. In such circumstances, argue logical behaviourists, the meaning of the sentence must be defined not in terms of the actual behaviour obtained, but in terms of the possible behaviour that would obtain under such circumstances. Such possible behaviour is called a behavioural disposition. Solubility for example is a dispositional concept. The statement 'the sugar cube is soluble' does not mean that the given piece of sugar cube at this very moment is actually being dissolved, but rather it could be dissolved if immersed in water. Thus the dispositional statement implicitly conveys a hypothetical conditional or a conditional of the counter factual variety like 'if it is immersed in water, the sugar cube will dissolve or would have dissolved'.4 The dispositional statement is definitionally equivalent to the conjunctions of such conditional statements. The dispositional properties like solubility, brittleness, etc., are single track dispositional properties the actualization of which is nearly uniform. Such simple models of disposition are not useful in dealing with the complex mental properties which are

multitrack behavioural dispositions the exercise of which is Indefinitely or perhaps even infinitely heterogeneous. Such behavioural disposition unpacks an infinite set of behavioral hypotheticals. A behavioural hypothetical is generally taken as a counter factual statement whose antecedent is couched in 'stimulus parameters' and consequent, in 'response parameters'.\(^5\) The stimulus -response parameters do not contain any mental vocabulary. And the mental statement is definitionally equivalent to the conjunctions of the behavioral hypotheticals. Consequently, 'mind-talk' can be translated into 'behaviour-talk'.

The dispositional statements, according to the behaviourists, do not describe any particular states or events. To possess a dispositional property" argues Ryle, "is not to be in a particular state, or to undergo a particular change; it is to be bound or liable to be in a particular state, or to undergo a particular change, when a particular condition is realized".\(^6\) The immediate consequence of this construal of disposition for the philosophy of mind is the rejection of internal mental states and processes. Such states and processes just inferred to explain one's actions are occult causes. Invocation of such processes would legitimize the use of phrases like 'in the mind giving the impression that minds are queer places for "special status phantasms"'.\(^7\) Since the mental properties are nothing other than multi-track behavioural dispositions, the analysis of these dispositions into behavioural hypotheticals provides an alternative kind of explanation that would not land in difficulties. "A statement ascribing a dispositional property to a thing" argues Ryle, "has much though not everything in common with a statement subsuming the thing under a law".\(^8\) The type of explanation we have when we say 'the glass broke because a stone hit it', is causal. Explanation in the realm of human or animal behaviour does not belong to this category. On the other hand, they

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\(^7\)Ibid., 40.

\(^8\)Ibid., 43.
are of the type 'the glass broke when the stone hit it because it was brittle'. That is, a behaviour is explained when it is subsumed under a law or a regularity. Such regularities are laid down in the behavioural hypothetical into which a dispositional statement is analysed.\footnote{Ryle's suggestion of subsumption strategy is employed by the functionalists. See Chapter 3.}

The strong version of logical behaviourism discussed so far is plagued with a number of difficulties. The number of behavioural hypothetical into which a psychological statement can be analyzed is in principle infinite or at least indefinite. In such cases, the psychological terms in the original statement cannot be properly defined, for as Churchland rightly points out "no term can be well defined whose \textit{definiens} is open ended and unspecific in this way".\footnote{Churchland, \textit{Matter and Consciousness: A Contemporary Introduction to the Philosophy of Mind} (Cambridge, Mass.:Bradford Books, 1988), 24.} The \textit{definiens} can be taken either as the conjunction or as the disjunction of the behavioural hypotheticals. In the former case, it is not possible to attribute a mental disposition if any one of the conjuncts is not obtained. In the latter case, it is not possible to determine the absence of a mental disposition in an organism as it might satisfy any one of the infinite disjuncts of behavioural hypotheticals. Moreover, on this account, there are many ways of telling what a mental state or process is. Consequently, there are as many meanings for a mental term as there are different ways of telling what it is. It leads to indeterminacy in the translation of mental statements into behavioural statements. If an attempt is made to overcome this difficulty by the \textit{ad hoc} stipulation that each way of defining, say, pain, is logically equivalent to the original psychological statement, then we have the odd corollary that a statement about saying ouch is equivalent to a statement about wincing. Such consequences are of course, counter intuitive. Moreover, the translation of mental talk into behavioural talk is objected to on the grounds that when a person reports the occurrence of pain for example, he means much more than the occurrence of behavioural responses.

It could be argued that the difficulties associated with the strong version of behaviourism could be easily overcome with a weaker version of
behaviourism. If it is granted that either logically necessary or logically sufficient conditions for the application of mental predicates is specifiable in behavioural terms we get a weak version of logical behaviourism. Such a weak version is read into the later Wittgenstein by Fodor and Chihara. They argue that according to Wittgenstein, there are conceptual or logical relations between statements about mental states and processes and statements about behaviour. This relation is not one of entailment but a special one called criterial relation, according to which the mental states and processes are ascribed to a person on the basis of certain behavioural criteria. The meaning of the mental terms is determined by the behavioural criteria which are conventions for the ascription of mental properties. Since the criteria are laid down by the rules of the language game, the relation between the mental statement and the behavioural statement is not a contingent relation based on observed correlation but is necessary and a priori. Obviously, this version does not imply that mind statements can be translated into behavioural statements.

Even the weak version of behaviourism is not a plausible doctrine of the mind, as it could be shown that the occurrence of behaviour is neither a sufficient nor a necessary condition for the ascription of mental predicates to an organism. If the behavioural response is a sufficient condition for the ascription of the mental state pain to an organism, the occurrence of pain behaviour implies that the organism is in pain. If on the other hand, pain behaviour is taken as the necessary condition, the absence of pain behaviour would indicate the absence of pain. However, both the theses are counter intuitive as Putnam has convincingly shown. There is nothing self-contradictory in speaking of hypothetical worlds in which there is pain but no pain behaviour and of those in which there is pain behaviour but no pain. It is quite possible to conceive a world in which the way mental states are related to responses is different from the way they are in our world. Putnam makes it clear by conceiving a world of 'super-spartans' who have the ability to suppress all involuntary pain

\[11\] See "Operationalism and Ordinary Language," in *Representations*, 35-62. We are neutral as to the plausibility of this interpretation.
behaviour yet have the capacity to feel pain.

Imagine a community of 'super-spartans' or 'super-stoics' - a community in which the adults have the ability to successfully suppress all involuntary pain behaviour. They may, on occasions, admit that they feel pain, but always in pleasant well-modulated voices - even if they are undergoing the agonies of the damned. They do not wince, scream, flinch, sob, grit their teeth, clench their fists, exhibit beads of sweat, or otherwise act like people in pain or people suppressing the unconditioned responses associated with pain . . . Yet there is a clear absurdity to the position that one cannot ascribe to the people a capacity for feeling pain.\textsuperscript{12}

This shows that pain behaviour is not a necessary condition for the ascription of pain to an organism. Similarly, the ascription of pain behaviour is not a sufficient condition for the occurrence of pain. It could be possible to conceive another world of pain pretenders who exhibit the pain behaviour that we have on the earth without the feeling of pain. It means that there is no necessary relation of any sort between pain and pain behaviour. In other words, the concepts of the mental and those of the behavioural are distinct. It reminds us of the Cartesian view regarding the conceptual distinction between the mind and the body. In the same vein, Putnam argues also that the mental states are not conceptually related to physical stimuli either. It is easy to conceive of a world in which pain stimulus and pain are related differently from the way they are related in the actual world. A person belonging to such a world, for example, might feel pain only when a magnetic field is present. Thus though the mental states, in our own sense, may be clearly present, they may have neither the normal causes nor the normal effects.

Both the strong and the weak versions of behaviourism agree on defining the mental states and processes on the basis of behaviour. However, it is a fact of our common experience that a given mental state does not invariably have the same behavioural manifestations. Consequently, a given mental state has different meanings depending upon the kinds of behaviour we use in defining it. If a dream report is taken

\textsuperscript{12}Putnam, "Brains and Behaviour," 29.
as the defining characteristic of dream, we have a concept of dream which is totally different from the concept of dream if dream-talk is employed as the criterion to determine the occurrence of dreams. If, in the course of scientific development, new methods are employed to determine whether a person is dreaming or not, we may have a totally different concept of dream. This will lead to bizarre consequences. For example, when research in psychology speaks of mental processes, as Fodor and Chihara note, it *ipso facto* commits the fallacy of ambiguity.\(^{13}\)

It is a fact of our common experience that there are mental processes that go on, even though they do not issue in any behaviour. When I think, my thinking need not result in any behaviour. However, it is obvious to me that there is something going on in me which I call thought. But behaviourism altogether denies the internal states and processes to which the mental vocabulary is generally understood to apply. As there is no tangible or visible criterion for the application of the mental terms from the first person point of view, it cannot make sense of the a person account of the mental states and processes. As Armstrong rightly points out, "[b]ehaviourism may be a satisfactory account of the mind from an other-person point of view, it will not do as a first-person account."\(^{14}\)

This amounts to a total rejection of all those phenomenal experiences and qualitative states a person is aware of. However, it is an undeniable fact about human beings that they are aware of things and this awareness or being aware of is so fundamental that it cannot be analysed in terms of, or reduced to, any kind of bodily happening or behaviour.\(^{15}\) As Armstrong observes; "In our own case, we seem to be aware of so much more than mere behaviour".\(^{16}\) When behaviourists try to reduce, the conscious mental states and processes, they in fact deny our rich world of phenomenal experiences. What is essential to pain, according to behaviourism, is pain behaviour. Certain versions of behaviourism include also the stimulus that produces

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\(^{13}\) Cf. Fodor and Chihara, "Operationalism and Ordinary Language," 53-54.


\(^{16}\) Armstrong, "The Nature of Mind," 197.
the pain behaviour in the defining characteristics of pain*. In spite of
the presence of pain producing stimuli, and the pain behaviour that usually
accompanies them, if a person does not feel the way pain feels to him, he
cannot be said to have pain. It could be argued against logical
behaviourism that it is logically and perhaps even empirically possible
that an organism in spite of producing the pain behaviour, in the presence
of pain producing stimuli, would not itself have the feeling of pain. This
shows that what is essential to the mental states is their phenomenality or
their qualitative aspects.

We have seen that behaviourism tries to explain the occurrence of
behaviour by appealing to the behavioural dispositions which do not refer
to any real states of the organism. The behavioural dispositions are
analysed into certain regularities. The occurrence of a behaviour is
explained when it is shown to be an instance of one such lawful regularity.
But insight into the nature of explanation suggests that an event is not
explained by citing it to be a special instance of an empirically
observable regularity. In the case of behaviour, it is the behavioural
hypotheticals themselves that need to be explained. The meaning of a
mental state term may be explained with reference to the overt behavioural
responses but occurrence of the overt behaviour itself is explained only by
appealing to the mental state or process which is a condition or an event
that causes the overt behaviour. So the mental states and processes should
not be identified with behavioural dispositions but rather with the causes
of behaviour.

Behaviourists might argue that the behavioural dispositions themselves
could be considered as the causes of behaviour. Suppose for behaviourists,
a headache is the disposition to take aspirin. Here it is right to say
'John took aspirin because he had a headache', but in the statement, 'John
was disposed to produce headache behaviour because he had a headache' we
cannot identify the headache with disposition to produce headache
behaviour. The second statement involves reference to mental causes, and
as Fodor argues, at least pre-theoretically we have no reason to doubt the
truth of the statement. Fodor observes that the term 'headache' does not
mean the same thing in the two statements. Had it been so the latter
statement would mean 'John is disposed to produce headache behaviour
because he is disposed to produce headache behaviour' which is absurd. This suggests that mental causes cannot be traded for behavioural dispositions.\textsuperscript{17}

The presence of behavioural dispositions does not always issue in the occurrence of behavioural responses. This is a challenge to behaviourist theory. Behaviourists try to overcome this difficulty by incorporating \textit{ceteris paribus} (other things being equal) clauses into behavioural hypotheticals. But such \textit{ceteris paribus} clauses in fact refer to other mental states. Even if a headache is identified with the disposition to take aspirin, a person suffering from headache would take aspirin only if the dispositional state is accompanied by other mental states such as the \textit{desire} to avoid pain, the \textit{belief} that taking aspirin would reduce pain etc. That is to say: "Mental causes typically have their overt effects in virtue of their interaction with one another, and behaviourism provides no satisfactory analysis of the statements that articulate such interactions".\textsuperscript{18} An analysis of mental causation will lead to an etiology consisting of a long chain of mental states which will account for mental processes like reasoning, problem solving etc. A "mental mechanics" can be developed only if the causal sequences articulating the causal law are identified. Behaviourism fails to identify the causal laws.\textsuperscript{19}

Logical behaviourism is a reaction to Cartesianism. It denies even the conceptual distinction between the mental and the physical. It denies all internal states and processes including those we are conscious of. It tries to explain the occurrence of human behaviour without appealing to the internal states. It could be seen that the various objections raised against logical behaviourism stem from intuitively plausible Cartesian intuitions like the conceptual distinction between the mental and the physical, phenomenality as one of the essential aspects of human mentality, and the appeal to internal states and processes for the explanation of human behaviour. According to the critics of behaviourism, the internal

\textsuperscript{17}``Introduction: Something on the State the Art,'' 5.
\textsuperscript{18}Ibid. Emphasis Fodor's.
\textsuperscript{19}Ibid., 6.
states and processes are the theoretical entities that are invoked for explanation. Such explanations are plausible even though there exist no logical connections between theoretical and observational terms. The postulation of such psychological entities can be justified, as Fodor and Chihara observe, on the basis of simplicity, plausibility and the predictive adequacy of the explanatory system as a whole.\(^{20}\)

2.2.2 Methodological behaviourism

Methodological behaviourism, is a very vehement reaction against dualistic metaphysics and the resultant view that the method of psychology is introspective. In order that psychology may have a firm scientific footing, it must have a method along the lines of the physical sciences and methodological behaviourism strives to devise such a method. It aims at the explanation of human and animal behaviour: their practically observable and measurable activities. For this the notions of mental states and processes are of little use. They are not clearly defined and there are no objective criteria for their application. For psychology to be firmly rooted in empirical reality, argue methodological behaviourists, the theoretical terms used in psychology must be operationally defined.\(^{21}\)

B.F. Skinner, the chief exponent of methodological behaviourism argues that the goal of psychology is the prediction and control of human and animal behaviour. For the accomplishment of this dual function the appeal to inner causes does not pay any dividends. Inner causes invoked are of two types: psychic inner causes and neural causes. Psychic inner causes like desire, belief, etc., have neither predictive success nor any value in controlling the behaviour of the organism. They are just ad hoc postulations based on behaviour attributing just those properties required to account for the behaviour. The extensive use of this pseudo explanation hides from us the actual factors responsible for the production of behaviour. The neural causes too are inferred from the occurrence of

\(^{20}\) Fodor and Chihara, "Operationalism and Ordinary Language," 56.

\(^{21}\) Note that logical behaviourism too is committed to an operational definition of mental terms. But unlike methodological behaviourism it is concerned with the mental terms occurring in folk psychology.
behaviour and hence cannot be legitimately used for the explanation of behaviour as the *explanans* is based on the *explanandum* itself. As the nervous system is not amenable to any manipulation and the relevant neurological facts required would not be available at the time of prediction, the neural causes are of no avail in the production and control of behaviour.\(^{22}\)

In the causal explanation of behaviour generally offered, it is possible to discern three causal links: an operation performed upon the organism from without, an inner state (neural or psychic) and the response. Skinner argues that in the prediction and control of behaviour, the second link in the causal chain can be wholly dispensed with. The argument he advances to this effect is as follows. If the internal events are lawfully related to the environmental events on the one hand, and the behaviour responses on the other, then the first and the third link in the causal chain are lawfully related. Consequently, internal states are superfluous as far as prediction and control of behaviour is concerned. So we must always turn to the factors responsible for the production of the second link. In such cases, we can avoid many tiresome and exhausting digressions by taking the behavioural response as a function of environmental events.\(^{23}\) Thus, for the description and analysis of behaviour, the variables of which behaviour is a function are to be identified. They are, according to Skinner, the genetic endowment of the species produced by the environment through natural selection, the antecedent events in the life of the individual of the species, and the current setting of the environment which shapes and maintains the repertoire of individual behaviour through another selection process namely, operant conditioning.\(^{24}\) Thus for Skinner Psychology is a study of the subtle and complex relations between behaviour on the one hand and, on the other, the environment — the environment in


\(^{23}\)Cf. Ibid., 41-42. This argument is known as the theoretician's dilemma: if the second link is lawfully related to the first and the third, then it is superfluous and if not, it is useless. See Owen J. Flanagan, *The Science of the Mind* (Cambridge, Mass.: Bradford books, 1984). 93-98.

\(^{24}\)Reflections on *Behaviourism and Society.* (New Jersey: Prentice-Hall. 1978), 85.
which the species has evolved and that In which its members lives and in response to which at a given moment they behave.\textsuperscript{25}

\textbf{2.2.2.1 Operant conditioning}

For the prediction and control of behaviour the effect of each variable upon the organism is to be quantitatively determined. Skinner argues that this is possible with methods and techniques of laboratory science which help us identify the laws specifying the relation between the relevant set of variables and the behaviour. Skinner claims to have found out the body of laws in his work on operant conditioning. Skinner identifies two main categories of responses, the respondents and the operants. The former are pure reflex responses elicited by specific prior stimuli. The latter, on the other hand, are emitted responses for which no obvious prior stimuli can be discerned. Operant conditioning is the process whereby an operant is made contingent upon the consequences that follow the behaviour without identifying a prior stimulus. An operant may be under the control of stimuli, but the relation between stimuli and the operant is not one of elicitation as the stimulus in the context of operant conditioning is part of the consequences of the behaviour. In other words, in operant conditioning, the response is governed by "the law of effect". The behaviour is acquired and maintained because of the stimuli that follow the behaviour and not the ones that precede it. These stimuli form part of the consequences of behaviour known as contingencies of reinforcement. If a given operant is followed by favourable consequences then that response is said to be positively reinforced. The positive reinforcement make the response more probable or frequent in future. According to Skinner, the science of behaviour, or psychology, is concerned with the study of variables that make the occurrence of operants more probable, and with measurement of this probability.

Operant conditioning is a special case of natural selection in the behavioural evolution. In biological evolution the environment has a distinctive selective role which explains the emergence of a new biological
trait. During the life of an individual there is a similar and equally important selective action of the environment which is responsible for the genesis of a new response. The selective action of the environment in the case of individuals, i.e., "the effects upon the individual organisms of extremely complex and subtle contingencies of reinforcement"²⁶ can be studied through experimental analysis of behaviour in the laboratory. The experimental device developed by Skinner for the analysis of behaviour consists of a cage with a rat placed in it. The cage has a bar attached to one of its walls such that the pressing of the bar releases food grains into a tray in the cage. Whenever the bar is pressed by the rat placed in the cage, the food grains are dropped. The food grains are called the reinforcer which strengthens the bar pressing operant. The strength of the operant is defined in terms of the time lapse between the last reinforcing event and the recurrence of the operant. The bar pressing operant is acquired and maintained by the reinforcer in the controlled experimental situation of the laboratory. The occurrence of the bar pressing operant is the function of a number of variables like positive reinforcement, events in the life of the rat, (say deprivation of food) and finally its genetic endowment.²⁷

In operant conditioning, it is not a particular response that is conditioned but a class of responses. An operant is not an accomplished act but rather a set of acts defined by the property of the consequences which are specified in physical terms. In other words, it is a behavioural pattern that is conditioned and not a particular instance of the behavioural pattern. The responses, which are similar, are grouped into a class and the term 'operant' describes and denotes this class. The

²⁶Reflections on Behaviourism and Society, 70.
²⁷The terms 'stimulus', 'response', 'conditioning', 'reinforcement' etc. are borrowed from Pavlov. However, operant conditioning is different from pavlovian "respondent" conditioning. In respondent conditioning the reinforcer is paired with a prior stimulus. The magnitude of the response elicited by the conditioned stimulus is increased and an attempt is made to decrease the time lapse between stimulus and response. In operant conditioning on the other hand, the reinforcer is made contingent upon the response. The operant is strengthened by making the response more frequent.
consequences that follow the response define certain properties with respect to which responses are taken to be similar or dissimilar. That is, if two responses have identical consequences, they are said to belong to the same class and if not, to different classes.

2.2.2.2 Rejection of cognitive psychology

Skinner argues that his theory of operant conditioning paves the way for an outright rejection of cognitive psychology. The statements of cognitive psychology, argues Skinner, can be rendered as statements of operant conditioning. Cognitive psychology appeals to intentional states and processes for the explanation of rational human action. It conceives knowledge as a system of internal representations. It invokes an internally represented system of rules in order to account for linguistic behaviour. Skinner argues that the theory of operant conditioning shows that none of these basic tenets of cognitive psychology are plausible in the ultimate analysis in terms of his theory of operant conditioning. Intentional states, the internal representation of knowledge, and the rules of language are modes and instances of operants which are physical in nature and this can be brought within the framework of natural science.

A successful psychological theory, according to Skinner, cannot use any intentional terms like beliefs, desire, intentions etc. for the explanation of rational human actions, as their employment pre-supposes the notion of rationality which is the very thing psychology is supposed to explain. So if we are to make progress in psychological explanations, appeals to beliefs, desires and other terms from the intentional idiom must be eliminated. In Skinner's opinion, the intentional idiom does not refer to the internal states and processes. These terms are just a way of referring to the controlling variables. So a statement containing intentions can be reduced to or translated into statements about operant conditioning that do not contain intentional idioms. The statement 'I am looking for my glasses' for example, is translatable into 'when I have done this in the past, I have found my glasses'. That is man behaves in a particular way not because of the consequences that are to follow but because of the consequences that have followed in the past. The 'goals', 'purposes' etc. of our behaviour refer to such consequences.
Like 'goal' and 'purposes' the intentional idioms of prepositional attitudes, like desires and beliefs, or any of their variants can be defined in behavioural terms. Quine who develops an epistemology within the broad framework provided by Skinnerian behaviourist psychology, argues that the characteristic mentalistic idioms of prepositional attitudes take the form of attributions of verbal disposition. 'x believes that p' for example, is modeled after the indirect quotation 'x says that p' as if to attribute to x the disposition to utter the sentence 'p'. Thus intentional idioms, according to Quine, describe mental states in a way that hints at disposition to verbal behaviour. The behavioural dispositions are in fact identical with certain physiological states or mechanisms. The physiological states are described dispositionally if they are identified by means of behavioural symptoms. Thus the intentional states are nothing other than behavioural dispositions which are ways of referring to the physiological. Skinner, it must be noted, does not deny the existence of so called intentional states we are said to be aware of. But they are just conditions of the body associated with behaviour. They are just collateral products of our genetic and environmental histories, having no explanatory force. Our behaviour and the associated conditions of our bodies have a common cause that lie in the environment. Under no circumstances can the conditions of the body we feel be considered as the causes of behaviour.

Cognitive psychology, according to Skinner, conceives knowledge as private mental states representing the world outside, these private representations available to organisms through introspection. These internal representations are like internal copies of the world, and cognition may be defined as the process by which we construct mental copies of the real world. But the formation of internal copies, argues Skinner, is objectionable on the ground that these internal copies are known by the

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29Cf. Ibid., 93-94.

30Skinner, Reflections on Behaviourism and Society, 71.
formation of yet another internal copy and so on ad infinitum. Some cognitivist on the other hand, argue that representations are not internal copies of the world, but a mental surrogate called the system of propositions. For Skinner, the possession of a system of propositions pre-supposes a mind with a certain system of organisations and structures. But there are no such internal organisations and structures. What is structured is only behaviour in its relation to contingencies of reinforcement. The representational theory of knowledge is modeled on practical behaviour. The so called cognitive processes are nothing but subtle and complex behaviour. For example, we associate things by putting them together and we compare them by placing them side by side in order to emphasize their differences. "These are actions of real persons. It is only in the fanciful world of an inner person that they became mental processes" To know something, according to Skinner, is not to represent the object of knowledge within ourselves but to have been affected by it. Since we are nothing other than our bodies which are in direct contact with the world, we respond to it many ways and our knowledge is nothing other than the repertoire of behaviour acquired thus.

Cognitive psychology conceives of language as the expression of the internal mental process called thought. It has two components: syntax, and semantics: internally represented systems of rules and meanings. Skinner dismisses this view of language. Thought for him is an internal surrogate of behaviour: "If we say something to ourselves before saying it aloud, what we say aloud seems to be the expression of an inner thought". Language for Skinner, is a behavioural repertoire of unique and extraordinary complexity having neither internally represented rules nor meanings. Seldom do we speak by applying rules. A person is said to speak grammatically if he behaves effectively under the contingencies maintained by the verbal community. The so called rules are just internal surrogate of behaviour. Similarly there is no internally represented meaning for a

31 Cf. Reflections on Behaviourism and Society, 104.
32 Ibid., 110.
33 Ibid., 51.
statement as its meaning is analysable in terms of the variables of which it is a function and these variables lie in the environment. In short, Skinner's main complaint against cognitive psychology is that it postulates an internal principle, a homunculus whose function is nothing other than that of the environment: "Having moved the environment inside the head in the form of conscious experience and behaviour in the form of intention, will, and choice, and having stored the effects of contingencies of reinforcement as knowledge and rules, cognitive psychologists put them all together to compose an internal simulacrum of organism, a kind of doppelganger, not unlike the classical homunculus, . . ."\(^{34}\)

For Skinner psychology is nothing other than the science of behaviour and it should form part of biology since the behaving organism must eventually be described by anatomists and physiologists. Physiology and anatomy specify the genetic endowment of the species and the modification of this internal factor during the life of an individual, which explain the occurrence of a given response at a particular moment. The variables that lie in the environment and the response which is the function of the variables do not occur in close spatial and temporal proximity. Physiology must make up for the gap by describing the physiological processes that intervene in them. However, the appeal to physiology would not render the terms and principles of the behavioural account useless. Even when the behaving organism is understood fully at the level of physiology, argues Skinner, a science of behaviour will be needed for both theoretical and practical purposes\(^ {35}\): for practical purposes because it is useful for the prediction and control of behaviour; for theoretical purposes because the behavioural analysis defines the task of the physiologist by specifying the function that the physiologist has to throw light upon.\(^ {36}\) As Quine clarifies it: To cite a behavioural disposition is to posit an unexplained neural mechanism, and such posits should be made in the hope of their

\(^{34}\)Reflections on Behaviourism and Society, 109.

\(^{35}\)Ibid., 70.

\(^{36}\)Ibid., 123.
submitting some day to a physical explanation.”

Skinner argues that explanations in terms of intentional states and processes must give way to behavioural analysis. The role of behavioural analysis will eventually be taken up by physiology. Thus there are three levels of explanation with varying degrees of depth: intentional, behavioural and physiological in that order. These three levels are obviously levels of reduction in the sense that the first can be reduced to the second, which in turn is reducible to the third. However, behavioural analysis has a special status: it must be retained, as we said above, for theoretical and practical purposes. Quine too subscribes to this view. According to him, the behavioural level of explanation is ideal for the description of language, the formulation of language rules and the explication of semantic terms. Though the behavioural level of explanation can ultimately be reduced to the physiological level of explanation in terms of nerve impulses and other organic processes, this ultimate reduction, according to Quine, must be resisted, because the third and the deepest level of explanation means that the mental states are identical with the states of the brain. This leads to intellectual discomfort as one may justify one’s mentalistic semantics by arguing that it is a matter of physiology and may reinstate the intentional idiom which the behaviourists tried to reject at the outset.

2.2.2.3 Objections to methodological behaviourism

Skinner’s full-fledged skepticism about the ontology of the mental states springs from the view that only the observable and the measurable figure in explanation and prediction. The intentional states are inferred entities with just those properties required for the explanation of behaviour. Since the inferred entities are neither observable nor measurable by usual scientific practices, they must be rejected as fictional. As a result, Skinner has ended up with the study of observables

37 Quine, "Mind and Verbal Disposition," 95.
38 Ibid., 87.
39 Ibid., 94-95.
namely, the Input - output relations i.e., the specification of the responses in terms of the history of stimuli. This, as Chomsky notes, is only the definition of the problem that requires explanation.\footnote{Chomsky, "A Review of B.F. Skinner's Verbal Behaviour," in NB I, 49.} The definition of the problem and the collection of the data mark only the starting point of any scientific activity. It is neither scientifically unreasonable nor contrary to the accepted scientific practice in well-developed sciences like physics to postulate a set of theoretical entities with specific properties. Hence the postulation of unobservable and unmeasurable intentional states and processes for the production and explanation of behaviour cannot be ruled out as totally unscientific. Hence too, as Flanagan remarks, there is no reason to abandon the intuition, however, pre-theoretic it might be, that psychology must make reference to intentional states if it is to explain our cognitive processes and behaviour. Merely logical and \textit{a priori} arguments against this view would not suffice. In his opinion Skinner himself seems to have realised that "a psychology which simply refused to admit the reality of any subjective, cognitive and affective, phenomena was just too incredible to satisfy the minimal plausibility constraints on an adequate psychology"\footnote{Flanagan, \textit{The Science of the Mind}, 87.}.

Similarly, the only relevant factor for the prediction of behaviour, according to Skinner, is information on the variables that lie in the environment. Though this is perfectly all right in the case of simple organisms, yet knowledge of the external factors is not sufficient in the case of complex organisms. As Chomsky points out, we need, in addition, cognisance of the relevant internal inborn structure of the organism whose function is to process the input and to organise the response. In the absence of independent, neuro-physiological evidence for the existence of such internal structures and processes, they are postulated on the observation of inputs (events stimulating the organs) and outputs (the responses of the organs).\footnote{Chomsky. "A Review of B.F. Skinner's Verbal Behaviour," 49.} The structures and processes thus conjectured are taken to be real provided no better strategy is forthcoming for
explanation and prediction. Skinner's conception of science is fallacious and it does not conform to well established scientific practice.

On Skinner's theory of operant conditioning prediction and explanation of behaviour turns out to be a very difficult task in everyday life, as it requires a knowledge of the entire history of the individual organism. Only a few experts who have studied the individual life history of the organism under laboratory circumstances can perform this task. The intentionalist theory on the other hand is within the reach of the common man. It does not require us to know the entire life history of an organism. Yet it has a better explanatory power and predictive success than Skinner's non-intentional theory of operant conditioning.

Granted that operant conditioning succeeds in explaining cognitive processes as well as the behaviour of the organism, it could legitimately be asked: Why should an organism respond to the operant conditioning at all? A proper answer to this question, it seems to me, requires us to postulate an internal mechanism within the organism with specific structures and organisation. For the production of a particular response at a given occasion, first the internal mechanism must associate the particular type of operant with a specific type of variable that lies in the environment in the form of contingencies of reinforcement; Second, it must discern that the situation encountered is similar to the one in the past; third, it should believe instantiation of a particular type of response will follow a consequence of a particular type as it has happened in the past. The association of the variables with responses and the identification of various variables or responses as either similar or dissimilar is possible only if there is an internal mechanism with a relational structure; without an inborn relational structure whose function is the identification of similarities and dissimilarities among variables and/or responses, operant conditioning would never be successful.

The need for an internal mechanism with relational structure for an account of the cognitive processes and for the explanation and prediction of behaviour, is in fact acknowledged by philosophers like Quine who is given to behaviouristic epistemology. He argues that, on hearing something similar to the old clatter of pans a dog goes to the kitchen under similar circumstances because of the "dog's subjective similarity ratings." Appeal
to this similarity factor is tantamount to an invocation of a dog's mental life. Quine's defence of this internal factor, however, is only half-hearted. The internal variable in his opinion, must not be granted any ontological status. Rather it must be explained away in terms of the dog's disposition to behaviour. That is, the dog's going to the kitchen after a clatter is the basis for saying that the clatter events as well as the dinner events are similar for the dog. But there is a blatant circularity in Quine's account. The dog's going to the kitchen is explained by appealing to the perception of similarity between the clatter events of the past and present on the one hand, and the perception of similarity among the old dinner events on the other. And the dog's perception of similarities in turn is explained in terms of the dog's going to the kitchen. There is only one reasonable way available for breaking the vicious circularity; take the internal similarity ratings as primitive and real. The internal similarity must be taken as the function of certain structures and organisations realised in the brain.

In operant conditioning, the behaviour is organised in relation to the contingencies of reinforcement because of the perception of certain relations existing between response and consequences. Such organisation of behaviour presupposes that the contingencies of reinforcement are somehow mentally represented. In the absence of the belief — in all probability a product of past experience — to the effect that a particular kind of behaviour is followed by specific types of consequences, the organism does not resort to the instantiation of a particular behavioural pattern of the several ones available to the organism. In Skinner's framework, an operant is strengthened because of the consequences that occurred in the past. However, an organism's response under definite circumstances can be explained only with reference to the specific consequences or the state of affairs that are to follow. This means goals and purposes cannot be ruled out. An organism behaves in a particular way because it wants to bring about a state of affairs. Beliefs, wants, purposes etc. refer to representational mental states which are causally responsible for the

behaviour. If at all operant conditioning provides any behavioural laws, they make sense only on account of the mentalistic or intentional laws that underlie them.

Skinner's claim that the description of verbal behaviour can be provided in terms of operant conditioning without invoking the internal representation of a system of grammatical rules is totally vacuous. In spite of his admission that the speaker of the language can manipulate his own verbal behaviour, Skinner does not specify the variables of which verbal manipulation is a function. Instead, he argues that rules of grammar are nothing other than *internalised* contingencies of reinforcement. This is, in fact, a veiled concession to the cognitivist thesis that the grammar of the language is internalised by the speaker. As Chomsky has shown, the new behavioural events are identified as sentences not because of their formal similarity with earlier sentences nor because of the identity of the grammatical frame of two events, "but because it is generated by the grammar that each individual has somehow and in some form internalised".44 The linguistic behaviour is better explained by the cognitivist hypothesis that the rules of the grammar are internally represented than by the behaviourist view that a speaker uses the language grammatically because of the contingencies maintained by the verbal community.

One of Skinner's purposes in developing the theory of operant conditioning is to render a description of the human creativity evidenced by the novelty of the behavioural responses, without falling back upon a miracle-working homunculus residing in one's head. But Skinner hardly succeeds in supplying a plausible account of the human responses within the framework of operant conditioning. Intuitively, the novelty of a response lies in its dissimilarity with earlier responses in the relevant respects. As Dennet rightly observes, to save his theory, the methodological behaviourist has to stipulate that the "new stimuli" and the "new response" are similar in some crucial but not yet specified respect to the old stimuli and the old response. This means the very same objection raised by

Skinner against intentionalist psychology could be raised against methodological behaviourism itself. Though no record of the earlier experiences of the present kind is available, the existence of such experiences is inferred, and such postulated experiences are endowed with the properties satisfying the theory of operant conditioning. That is to say, "these postulated earlier experiences are claimed to resemble-in-whatever-is-the-crucial-respect the situation they must resemble for the Skinnerian explanation to work."\(^{45}\) A careful analysis of operant conditioning shows that Skinner has taken mind out of the organism and placed it in the environment attributing to it all the properties of that form the essence of mind from intentionalist point of view. Just as the environment selects the biological traits in the case of evolution, it selects the response or behavioural pattern of the organism.

A serious defect of the behavioural analysis as a psychological theory is brought to light by Chomsky. The various technical terms used in the theory of operant conditioning are unsuited for the description of the real life behaviour. Though terms like stimulus, response, reinforcement etc. are well defined in the context of laboratory experiment, when used to characterise behaviour of the real persons they lose their objectivity of meaning and turn out to be in certain cases cover terms for intentional idioms. On the occasion of the emission of a response by the organism there could be a number of stimuli in the environment. The controlling stimuli can be identified only after the response has been emitted. The controlling variables can be specified only from the point of view of behaving organism. On this account stimuli are no longer part of the outside world. They are driven into the organism. That is to say, the "talk of stimulus control disguises a complete retreat to mentalistic psychology". Similarly, the term response is also vague as there are no criteria for the identification of the proper response in ordinary behaviour. This becomes clear in the case of verbal behaviour.\(^{46}\)

Reinforcement, the key term in Skinnerian psychology is also similarly


infected with ambiguities. Citing a number of examples from Skinner, Chomsky argues that a particular behaviour can be reinforced even in the absence of response or of impingement of reinforcing stimuli upon the organism. In order to be reinforced, it is not necessary that the contingencies should exist. It is sufficient that they be imagined or hoped. If so, *reinforcement* works as a cover term for intentional terms like *wants*, *desires*, *likes* etc.

Skinner undoubtedly scores a point when he argues that a psychological theory within the broad framework of materialistic monism cannot make any final appeal to intentional states since they have to be finally analysed in physical and mechanical terms. It does not follow from this that intentional idioms have no legitimate place in a psychological theory. The intentional idioms of a psychological theory specify certain characteristic functions of the organism that must be finally understood at the physiological level. In Dennet's opinion, the intentional idioms must be used provisionally "to map out the functions of the behaviour control system of men and animals" till we finally "cash them out" by designing mechanisms that perform functions specified by the intentional theory. In this endeavour, Skinner's behavioural analysis which too specifies the functions of the organism in terms of behavioural disposition cannot be a match for intentional psychology as it rules out many relevant intentional states and processes simulated by the behaviour control system and information processing machinery. In other words, a mechanism designed to map out the functions specified by behavioural analysis would be a poor substitute for the one constructed to model the mind as described by intentional psychological theory. Though Skinner's attack on intentional psychology is unwarranted, his criticism of dualistic metaphysics and the rejection of a homuncular model in the explanation of human cognitive processes and functions is a decisive step in the development of cognitive science.

2.3 PHYSICALISM

Generally speaking, physicalism is the doctrine that all events which fall under the laws of special sciences like economics, sociology, psychology etc. are physical events and hence fail under the laws of physics, the most basic of all sciences. In the context of the philosophy of mind, it is the doctrine that "a person, with all his psychological attributes, is nothing over and above his body, with all its physical attributes." On this broad construal, all psychological theories developed within the general framework of materialistic monism are cases of physicalism. Accordingly the versions of behaviourism discussed above are also physicalist theories. For our discussion we use the term in the restricted sense, namely, that the mental states, events and processes are nothing over and above some physical states, events and processes. It means that the subject matter of psychology is a part of the subject matter of physics and every phenomenon that has a psychological description in terms of mental terms like pain, belief, desire etc. has a description in the vocabulary of physics. Physicalism appears in two versions of event-identity thesis, namely, type-type identity theory and token-token identity theory.

2.3.1 Type-type identity theory

The type-type identity thesis (type physicalism) is the specific doctrine that the property of being in a certain kind of mental state is identical with the property of being in some kind of physical state. In other words, "each type of mental state or process is numerically identical with (is one and the same thing as) some type of physical state or process within the brain or central nervous system". So the mental properties are identical with neural properties. Having pain, for example, is a mental property which according to the identity theorist, is identical with the hypothetical C-fibre firing, a neural property. When the type physicalists speak of the identity of the mental (states) with the neural (states), both

49 Churchland, Matter and Consciousness, 26.
the mental and physical states are taken as universals, capable of repeated instantiation. The mental state pain for example is instantiated in different individuals and in the same individual at various times.50

The identity theorists argue that there is a one to one or at least a one-to-many correspondence between mental and neural types. Consequently, the identity thesis is said to result in reductionism, the doctrine that the mental states can be reduced to certain physiological states of the brain which in the course of the development of science will be reduced to certain physical types. If this is true, psychology is reducible to neurobiology which again is reducible to physics. A psychological theory, we know, is a body of its laws. These laws contain mental state terms as theoretical terms. Since mental types are identical with neural types, the mental type terms in the psychological laws are replaceable by neural types terms. The resulting statements would be the laws of neurobiology. The inter-theoretic reduction as it is often called, proceeds as follows. Let \( S_1, S_2 \ldots S_n \) be predicates of psychology. Then the laws of psychology are of the form:

(a) \( S_1x \) causes \( S_2y \).

It states that all events of x's being \( S_1 \) bring about events of y's being \( S_2 \). If the law of this form is to be reduced to a law of neurobiology, there must be a neurobiological law of the form:

(b) \( N_1x \) causes \( N_2y \)

where \( N_1 \), and \( N_2 \) are predicates of neurobiology. Now a law of the form (a) is reducible to that of the form (b) only if, the psychological kinds are identical with the neurobiological kinds. That is to say, there must be certain bridge laws which state the relevant identities for each of the psychological predicates occurring in the body of psychological laws. The bridge laws are of the following form:

\[
(C_i) \quad S_1x = N_1x
\]

They state the identities of psychological and neurological kinds. \((C_1)\), for example, states that all events of \(x\)'s being \(S_1\) are same as the events of \(x\)'s being \(N_1\). Such identities presuppose that each natural kind predicate in an ideally completed psychology is identical with some natural kind predicate in neurobiology. This means that the psychological predicates and some neurobiological predicates are co-extensive. Since these co-extensions are lawful, psychology is reducible to neurobiology. The same argument can be used *mutatis mutandis* to show that neurobiology is reducible ultimately to physics.\(^{51}\)

It is very important to note that the type identity theory is concerned with event identities. That is, all mental events are neural events. The construal of identity theory as pertaining to event identities has the advantage of circumventing certain difficulties. If we consider mental states and processes objects of our experience, viz., intentional objects or sense data, it implies that there are some mental entities. The identity thesis then means that mental entities are identical with certain neural entities. The concept of mental entities and the concept of neural entities are different. Mental entities have certain phenomenal characteristics whereas the neural entities lack them. Similarly the mental objects do not have a spatial location whereas the neural states and processes are located. Since the mental and the neural are by their very definition distinct, the identity thesis states that something which is not mental is identical with the mental, which is a contradiction. This objection, argues the identity theorist, is the result of viewing mental states and processes as the objects of one's experience. According to Smart, this objection can be overcome by dropping the idea that the mental states and processes are intentional objects or sense data. He argues,

> if it is objected that the after-image is yellowy-orange, my reply is that it is the experience of seeing yellowy-orange that is being described, and this experience is not a yellowy-orange

\(^{51}\)Cf. Fodor, "Special Sciences, or The Disunity of Science as a Working Hypothesis," in NB I, 121-123.
something. So to say that a brain process cannot in fact be yellowy orange is not to say that a brain process cannot in fact be the experience of having a yellow-orange after-image. There is, in a sense, no such thing as an after-image or a sense datum, though there is such a thing as the experience of having an image, and this experience is described indirectly in material object language, not in phenomenal language, for there is no such thing.\textsuperscript{52}

So the identity thesis does not speak of the identities of intentional objects or sense data with the brain processes. Rather mental events like the experience of having an image are identified with brain events.

For the type physicalists, the event identities are nomologically necessary. That is, every event which consists of x's satisfying a psychological property is identical with an event which consists in x's satisfaction of a neurological property. Yet, these event identities are logically contingent. These are discovered through empirical investigations. Hence like any other scientific thesis they are refutable in the light of evidence to the contrary. Making use of Frege's distinction between sense and reference, the identity theorist argues that the sense of the psychological kind predicate and that of neurological kind predicate differ; yet both alike refer to the neural states which are experiences, just like the expressions 'morning star' and 'evening star, refer to the planet Mercury.\textsuperscript{53} Therefore, identity theory does not imply that whatever is true of mental states is true of neural states nor vice versa. The statements ascribing mental properties and those ascribing neural properties would have meant the same if both the statements are necessarily equivalent. But they are not. First of all, the mental state ascriptions and the neural state ascriptions are verified differently and hence differ in meaning. Secondly, one can assert a statement about a psychological state without any knowledge of the corresponding neurological state. Thirdly, it is perfectly conceivable that one may have a mental state, say the occurrence of pain without corresponding a neural state, say the C-fibre firing. Because of the above reasons, it is argued that the

\textsuperscript{52}J.J.C. Smart, "Sensations and brain processes" in C.V. Borst. The Mind/Brain Identity Theory. 61.

identity thesis is not a logical truth, but a contingent truth, like the scientific hypothesis, say 'lightning is a motion of electric charges'. Since the identity thesis does not state any logical truths, there is no contradiction in the statement 'pain is not C-fibre firing'. Those who consider identity thesis to be a logical truth think that they can be dismissed purely on logical grounds. The identity thesis cannot be taken as a logical truth; and hence it cannot be dismissed purely on logical grounds. Some critics of the identity thesis take it to be a logical truth because of their failure to distinguish between the 'is' of composition and the 'is' of definition. The statement 'A square is an equilateral rectangle' expresses definitional identity. It expresses a necessary truth. 'His table is an old packing case' is a statement of compositional identity. There is no logically necessary or conceptual relation between 'table' and 'packing case' for something can be a packing case without being a table and vice versa. So the statement is only a contingent identity where the expressions 'table' and 'packing case' happen to refer to the same object. This can be established only through observations. The mind-brain identity thesis is a case of compositional identity. It lays down a contingent truth which is to be established or dismissed purely on the basis of scientific investigation and not on logical grounds.54

2.3.2 Token physicalism

Unlike type physicalism which applies to mental universals, token physicalism or the token-token identity thesis is concerned with mental particulars. According to this doctrine, each particular mental event is identical with some physical event or other. For example, if Jones' pain at t is a mental token and if Jones' C-fibre firing at t is a physical event, then 'Jones' pain at t is identical with Jones' C-fibre firing at t is a statement of token identity. Thus the token identity theory states that a mental event and physical event occurring in one and same person at the same time are identical. The meaning of the word 'event' plays a vital role in understanding this theory. An event in the ordinary sense of the term means an occurrence involving a change in the condition of the world.

However, token physicalists construe an event in a broader sense: any instance or realisation of a state at a time without specifying any change associated with it. Hence events are taken to mean unrepeatable dated individuals.

Suppose the psychological character of any event is identified with some aspect of its physiological character as type physicalists maintain. Then type physicalism entails token physicalism. However, it may be noted that token physicalism does not entail type physicalism as it is committed only to the minimal view that any mental event is identical with some physical event or other. Consequently, events belonging to a given mental type could be identical with heterogeneous physical events.

A powerful argument for the token identity thesis has been advanced by Donald Davidson. According to him, events are classified as mental or physical on the basis of their description. An event is mental if and only if it has a mental description, one which contains at least a mental idiom essentially. A physical event is one which has a description involving a physical vocabulary essentially. These diverse descriptions suggest that there are two domains; one mental and the other physical. The laws are description dependant. Hence the laws of the mental pertain to the mental realm and the laws of the physical hold only in the physical domain. The causal laws pertain only to the physical domain; within the physical domain an event is explained by appealing to a causal law that connect it with other events and conditions that are physically described. The constitutive principle that governs the mental domain is the ideal of rationality. It requires that the various beliefs, desires and intentions of the agent must be consistent and coherent. Because of the disparity between mental and physical descriptions, there are no lawful causal relation between the mental events and the physical events. The reason is that causal laws are applicable only to the physical events. But we know that there are causal relations between the events described as mental and the events described as physical. In the case of intentional human action, for example, the mental events cause the physical events. Similarly mental

Davidson, "Mental Events," in NB I, 107-19.
events such as perceptual beliefs are produced by certain physical events. Davidson argues that the singular statement of causal relation between a mental event and a physical event does not instantiate deterministic causal laws on the basis of which mental events can be predicted and explained. The thesis that there are no causal laws linking the mental and the physical properties is known as psychophysical anomalism.

On the basis of the causal interaction between the mental and the physical and the principle of psychophysical anomalism, argues Davidson, it is possible to establish that the mental events are identical with physical events. Two physically described events related as cause and effect instantiate a causal law. In accordance with anomalism of the mental, though there exists a causal relation between the mental and the physical, it does not instantiate a causal law, for the events belong to two different descriptions. However, the existence of a causal relation between two heteronomous events shows that the causal relation between them instantiates a causal law under proper description. If the mental event \( m \) caused a physical event \( p \), then there is a strict causal law which \( m \) and \( p \) instantiate. But we know that the causal laws hold only among physical events. So if the mental event \( m \) falls under a physical law, then it has a physical description, which means \( m \) is identical with a physical event.\(^56\)

A causal law relates two distinct kinds of predicate expressing physical properties. So does it not follow that a mental event which has a physical description has certain physical properties and that the predicates expressing the mental properties and the kind predicates expressing physical properties are co-extensive? If so, this could mean that mental events of a certain type are correlated with physical events of some kind. But Davidson does not accept this conclusion. He argues that "it is possible (and typical) to know of the singular causal relation

\(^56\)Davidson concedes that, according to this argument, only those mental events which enter into causal interaction with physical events are shown to be identical with physical events. The argument does not touch mental events if there are any which do not at all enter into causal relation with the physical. To show that every mental event is a physical event, it is sufficient to show that any mental event is a member of the causal chain linked to a physical event.
without knowing the law or the relevant descriptions".\textsuperscript{57} It is possible to know that a mental event is identical with a physical event without knowing which \textit{kind} of physical event it is. In other words, we are not able to find the unique physical description of a mental event that brings it under a causal law. Mental characteristics are in some sense supervinient or dependent upon physical characteristics. But this does not mean that the mental characteristics can be lawfully reduced to the physical.

Fodor, another philosopher committed to token physicalism argues that in spite of the fact that a psychological event is identical with a neurological event, it is unlikely that the kind predicates of psychology are co extensive with kind predicates of neurobiology.\textsuperscript{58} Even if there are such co-extensions, they cannot be lawful. They turn out to be only a matter of contingent fact. We can undoubtedly imagine a world in which every psychological event is paired with some neurological event or other but the psychological events of the same kind are sometimes paired with neurological events of different kinds. This requires, of course, that type distinct neurological events must be identical in respect of whatever properties are relevant for type identification in psychology. What corresponds to kind predicates in psychology may be heterogeneous and unsystematic disjunctions of kind predicates in neurobiology (or physics). Hence a given type of mental events could fall under different physical laws. As a result mental kinds cannot be correlated with physical kinds, though each mental event is identical with some kind of physical event or other.\textsuperscript{59}

Richard Boyd explains that there could be different physical mechanisms responsible for the realisation of a given mental kind (type) by invoking the notion of \textit{plasticity}. "By plasticity of a type of event, state or process", Boyd means "its capacity to be realised in more than one

\textsuperscript{57}"Mental Events," 117-118.

\textsuperscript{58}Fodor, "Special Sciences, or The Disunity of Science as a Working Hypothesis," 125.

\textsuperscript{59}Cf."Special Sciences. or The Disunity of Science as a Working Hypothesis," 124-129.
Two factors that go into the definition of a given type of event are its configuration and its composition. By configuration of an event Boyd means its form or structural aspects, and by its composition the causal factors or the kind of substance that constitute it. Plasticity of a type-event can be understood either with reference to composition or configuration. Consequently, there are two kinds of plasticity: configurational and compositional. The configurational plasticity of a type of event means that "its possible token realisations differ in the configuration or arrangement of their constituent parts, events, substances, or causal factors". Smelting of iron for example, is an instance of the type of event that has configurational plasticity since its various tokens may realise different geometrical arrangements. However, it has minimal compositional plasticity since all tokens of this type of event are realised only in iron. The compositional plasticity of a type of event, means that its possible token realisations differ in the sorts substances that constitute them. If there are types of events that are entirely configurational, then such events, according to Boyd, have maximal compositional plasticity.

According to Boyd, there is an important class of states or events, namely the computational states of a computer, that has unlimited compositional plasticity but relatively little configurational plasticity. The configurations of the various computational states are entirely determined by the machine language programs, which would specify what would be the arrangement of the causal factors for the realization of a type of computational state, say $e^x$ for the input $x - 9$. As this computational state type can be realised by mechanical, electronic or hydraulic computers, it possesses a high degree of compositional plasticity. In Boyd's opinion, mental states are analogous to the computational states. What is essential to various mental states is the "information processing roles" they play with respect to the animal's nervous system and body in general, and not the mechanism by which they are realised. These various

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61 Ibid., 88.
types of "functional" states of the organism are purely configurational and hence they possess maximal compositional plasticity. This means that though various mental state types are neurologically realised, there could be non-neural or non-physiological realisations of them. It is logically possible that they could even be non-physically realised. The individual events of a mental type are realised in various ways. Hence mental types are not identical with physical types. Since an event of a mental type is realisable by some physical event or other belonging to different physical types, one can only speak of token identities. In short, the argument is that since mental states are type identified on the basis of their configurationality, a given mental state type which is purely configurational has a multiple realisability. That means mental states cannot be type identified on the basis of the nature of the physical factors that compose them. Since a given mental state type is realised by some physical type or other, we can only say that a particular mental token is identical with some particular physical token or other, and nothing more.

2.3.3 Objections to physicalism

2.3.3.1 Objections to type physicalism

In this section we shall discuss the various objections to the two versions of physicalism discussed above. Our first concern will be with type physicalism. There are two closely related objections to it. The central theme of these objections is the Cartesian intuition that there is no necessary relation between the mental and the physical, and since the mental can be conceived of independently of the physical, the mental cannot be reduced to the physical. The first objection says that a given mental state type can be realised in more than one way. So given any mental state type, there is no single corresponding physical state type to which the former can be reduced. We shall call this the argument from the multiple realisability of the mental. The second objection says that what is essential to a given type of mental state is its phenomenal or qualitative aspect. It is possible that the qualitative aspects of the mental states occur without the physical state type with which it is identified. We shall call it the qualia argument against physicalism. Both the objections
take it for granted that for the type physicalists, the relation between the mental and the physical is necessary. And the objection is raised from the view that there exists only a contingent relation between the mental and the physical.

2.3.3.1.1 The multiple realisability argument

The argument runs as follows. There are possible worlds where creatures appear and behave exactly like us humans. When pricked with pins for example, these creatures make loud noises and report to us that they are feeling pain and try to keep the afflicted part of the body away from the pricking pins. Such intentional behaviour is sufficient for attributing mental properties to such creatures. However, it is possible that their internal processes are radically different in kind from ours. If type physicalism is true we cannot attribute psychological predicates to these creatures because on this thesis no organism that differed in physical constitution could instantiate mental properties. This seems to be quite counter intuitive since such creatures could be attributed with mental properties at least on the basis of their intentional behaviour.

The objection stems not only from the intuition that a given mental state type could be realised by means of physically diverse mechanisms in different species but also from the view that the members of the one and the same species could realise a given mental state type by means of a variety of physiological means. As Fodor puts it,

> it is entirely possible that the nervous system of higher organisms characteristically achieves a given psychological end by a wide variety of neurological means. It is also possible that the given neurological structures subserve many different psychological functions at different times, depending upon the character of the activities in which the organism is engaged. In either event, the attempt to pair neurological structures with psychological functions could expect only limited success”.

Such intuitions as the above have very important consequences for psychology. The psychological laws which employ mental type laws as

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62 Fodor, "Special Sciences, or the Disunity of Science as A working Hypothesis", 125.
theoretical laws cannot be reduced to a corresponding neurological law obtainable by replacing the psychological kind predicates with neurological kind predicates. As a result, there cannot be any neurological laws isomorphic with the psychological laws. That is to say, there could be psychologically relevant generalisations of certain events whose physiological descriptions have nothing in common. The truth of such psychological generalisations does not depend upon the fact that their physical descriptions have something in common.

The identification of psychological types with certain neurological types implies that only creatures with a specific neurological organisation comes under the purview of psychological theories. A psychological theory, however, argues Fodor, must be sufficiently general, to subsume all sorts of entities and systems possessing psychological properties. There must be a level of abstraction at which the physiological differences of the systems in which the psychological properties inhere do not matter at all for psychology. There are real and perhaps also other possible information processing systems that share our psychology but do not share our physiological organisation. The psychological theories based on type physicalism fail to take into account all such systems. As type physicalism restricts the natural domain of psychological theorising, a theory based upon it would not be able to state all the interesting psychological generalisations that there are to state.

One may try to defend type physicalism against the argument from multiple realisability by saying that a given mental type is identified not with a single physical type but with disjunctions of such physical types. On this view, identity statements are of the form \( \text{Tain} = \text{Brain state} \quad \text{B}_1 \quad \text{or Brain state} \quad \text{B}_2 \quad \text{or} \quad \ldots \quad \text{Brain state} \quad \text{B}_n \). The difficulty with this strategy lies in the fact that the disjunction could be infinitely long and the disjuncts could be heterogeneous types. It is doubtful if mental types could be identified with such open ended disjunctions. It is highly unlikely that the heterogeneous disjuncts have any genuine physical property in common with which the mental property can be identified. It follows from this that mental types are not unitary ones. That is, a given mental state type, say pain, may not have anything physiological in common by virtue of which it is called pain. Moreover, there is no criterion for
the inclusion or the exclusion of any physical properties from the infinitely long disjunctions. So any physical property can be included in it. Similarly any physical type which is a possible member of the disjunctive physical types with which a given mental state is identified can occur in a different disjunction that defines a totally different mental type. It has a very odd consequence: mental types collapse into one another. This, of course, is not happy news for the type-identity theorist.63

2.3.3.1.2 The qualia argument against physicalism

The Cartesian idea that the qualitative aspects or the phenomenological characteristics of mental states are essential to and definitive of them forms the foundation of this argument against type physicalism. Various versions of this argument are found in the literature. I shall be concerned only with two of them, namely those of Kripke64 and Nagel.65

2.3.3.1.2.1 Kripke's modal argument

Kripke's objections to type physicalism spring from his theory of modality and his general semantic thesis. He argues that natural kind terms like pain, water, cold, heat etc. are rigid designators. That is, they refer to the same kinds of entities in all possible worlds in which they exist. The natural kinds have certain essential properties which are not description dependent but belong to the very nature of the substance itself. For example, it is an essential property of a water molecule that

it contains one Oxygen atom and two atoms of Hydrogen. Like 'water' 'H₂O' is also a rigid designator. So if the statement 'Water = H₂O' is true, then it is necessarily true, because it refers to the same kind of thing in the actual as well as other possible worlds where 'water' or 'H₂O' has reference. Though the statement expresses a necessary truth, we do not arrive at it by an a priori analysis of the meaning of the term 'water' or 'H₂O' but a posteriori by means of scientific investigation. This means that on Kripke's account apriority and necessity do not coincide. There could be statements which express a necessary truth which are determined a posteriori. That is we cannot say that a statement is contingent by showing that its truth is arrived a posteriori.

Though the identity statement 'Water = H₂O' is necessary if true, we have very strong intuition that it is a contingent statement. Hence this intuition has to be successfully explained away. This, according to Kripke can be done by finding a genuinely contingent identity statement by replacing one or more of the rigid designators of the necessary statement by definite descriptions in sensible properties. In the case of the necessary statement, 'Water = H₂O' one of the corresponding contingent statement is: 'The cooling, tasteless, odourless, wetting liquid that quenches thirst = H₂O'. It is contingent because the definite description in terms of sensible properties is not a rigid designator. So it is conceivable that there is a world in which the definite description 'The cooling, tasteless . . . ' does not refer to H₂O but some other liquid say xyz. The apparent contingency of the identity statement 'Water' = H₂O' according to Kripke results from confusing the meaning of this statement with that of the corresponding genuinely contingent statement.

For Kripke the mental state terms are natural kind terms and hence rigid designators. Similarly the neural kind terms too are rigid designators. So the type identity theorists make a posteriori necessary statements. For example, 'Pain - C-fibre firing* is necessary if true. This means pain cannot be felt in a world in which C-fibre firing does not occur. However, we have a very strong philosophical intuition that pain is only contingently identical with C-fibre firing. For there could be a possible world, call it W₁, where pains are felt the way they are in the actual world without there being any C-fibre firing. Similarly, there
could be another world $W_2$ where there is C-fibre firing, but no feeling of pain associated with it. But Kripke argues that the kind of strategy with which we explain away the contingency of 'Water = $H_2O$' cannot be of any use here. Because in the statement 'Pain = C-fibre firing' it is not possible to replace the rigid designator pain with an expression in qualitative terms and get a qualitatively analogous statement which is contingent. That is, the possible worlds $W_1$ and $W_2$ are inconceivable if the identity statement is true. Since pain is identical with the C-fibre firing, the events in $W_1$ having the sensible property of pain which is not C-fibre firing is not pain. On the other hand, the C-fibre firing in $W_2$ is pain though it does not feel like pain in the actual world. The mind-brain identity theory leads to these kinds of absurdities and contradictions because at least some mental states have as their essential properties the way they feel. Thus sensible qualities of pain are essential to and definitive of it. In any possible world something that feels like pain is pain, and no pain fails to feel painful. There cannot be a world like $W_1$ where something feels like pain but is not pain for if anything feels like pain, then necessarily, it is pain. And there cannot be world like $W_2$ where pain fails to feel painful because in any possible world a natural phenomenon that is pain must feel like pain. So the type-identity theorists fail to explain away the contingency associated with the if-true-necessary mind brain identity statements. If contingency is not explained away, the Cartesian intuitions cited above would entail that pains are distinct from C-fibre firing. Consequently, the type identity theorist would land in a contradiction because he in effect argues that a mental state is identical with a non-mental state.

Richard Boyd argues that the illusion of the contingency of the statement Tain = C-fibre firing’ can be successfully explained away by getting a contingent qualitatively analogous statement by replacing the rigid designator 'C-fibre firing' with a purely qualitative description that does not designate rigidly. This means there could be a possible world where there are nerve fibres which are not C-fibres but look exactly like C-fibres. It is possible that the real C-fibres in such a world do not look like C-fibres in the actual world. The firing of these C-fibre-looking nerve cells would result in the belief that C-fibres fire
without pain being felt. Similarly, the real C-fibre may fire in such a world without being detected in the ordinary way which would give the impression that pain is being felt without C-fibres being fired.\(^66\) This strategy, undoubtedly succeeds in explaining the illusion of contingency. However, it fails to appreciate the Kripke's Cartesian intuition that pain might exist or occur without any physical type whatsoever. It is definitive of pain that it is felt in a certain way. But the essence of C-fibre firing does not consist in its being felt in a certain way. Hence pain and C-fibre firing are distinct. This objection from the Cartesian intuition is not met by arguing that pain could be identical with a physical type other than the one it is identified with. Kripke's objection to identity theorists is that mental states could occur without the occurrence of any physical states.\(^67\)

### 2.3.3.1.2.2 Nagel's epistemological argument

Nagel's objection against type physicalism is very much in line with Kripke's because like Kripke he is committed to the view that phenomenological properties are essential at least to some mental states. The difference between the two lies in the fact that while the former raises a logical argument, the latter develops an epistemological version of it. However, it must be noted that as far as qualia arguments are concerned, it is very difficult to keep logic and epistemology apart from each other. Nagel's main objection against type physicalism is that it does not take into account the element of consciousness involved in the conceptions of mind. According to him, "an organism has conscious mental states if and only if there is something that it is like to be that organism - something it is like for the organism".\(^68\) This aspect of consciousness essential to our mental life is characterised by Nagel as "the subjective character of experience". Every such subjective phenomenon is essentially connected with a single point of view. By the subjective,


\(^{68}\)Nagel, "What Is It Like to Be a Bat?" 392,
single or particular point of view, Nagel does not mean an individual's point of view, it is a species specific point of view and in this sense, the subjective character of experience or the single point of view is a type of its own as it has various instantiations within the same species. Nagel grants that there are many such species specific points of view. Just as there is something it is like to be humans, there is also something it is like to be bats or martians. In addition to various species specific (or particular) points of view, there is an objective point of view. The objective point of view is something shared by different points of view. Yet it is independent of the subjective point of view. According to Nagel, the subjective or species specific point of view cannot be translated into the objective point of view because the objective and the species-specific point of view are discrete. So only humans can know what is it like to be humans and similarly only martians can know what it is like to be martians. And their subjective experiences cannot be translated into the objective vocabulary which is by assumption common to both. Hence there is no way of explaining to a martian what it is like to be a human and vice versa. Nagel explains it with the example of bats. A bat's perception of external objects is by means of reflections from objects, of its own high frequency sound signals and it is not anything like the visual experience we humans possess as far as subjective conscious content is concerned. Assume that bats have certain neurological processes correlated or identical with perceptual processes. These neurological processes can be explained and described in the objective vocabulary. But no idea of "the internal neurophysiological constitution of a bat" can provide us with the subjective point of view: What it is like to be a bat. The analogy of bats, argues Nagel, has its bearing upon the mind-body problem:

For if the facts of experience - facts about what it is like for the experiencing organism - are accessible only from our point of view, then it is a mystery how the true character of experiences could be revealed in the physical operation of that organism. The latter is a domain of objective facts par excellence - the kind that can be observed and understood from many points of view and by individuals with differing perceptual systems.69

69"What Is It Like to Be a Bat?" 397.
The point is that by knowing the physical process of the brain, we cannot come to know the real nature of the subjective or species specific point of view. Nagel does not reject the possibility that there are physical processes responsible for the production of mental processes, but suggests that by knowing these physical processes we cannot come to know the conscious content of our experiences. It is possible that the mental states are identical with the physical states but "[w]e do not know which physical states and events they are, . . ." 70 So the mental types cannot be identified with physical types. According to Nagel, any identification make sense only within a conceptual or theoretical framework — a comprehensive framework which includes the concept of the things to be identified. But in the case of psychological identification such a comprehensive framework has not yet dawned upon us. As a result, we do not as yet know how the mental and physical terms refer to the same thing. So the usual analogies of theoretical identification in other fields does not throw any light upon the psycho-physical identification.

2.3.3.2 Type physicalism reinstated/reestablished

The above objections to type physicalism are very detrimental to the development of psychology within the framework of materialistic monism. Therefore a psychologist committed to materialistic monism must refute these objections to type physicalism. Most of the opponents of type physicalism take this doctrine as an attempt to define mental states in terms of certain physical states and as a result, they construe it as a reductionist analysis of the mental. Some of the type physicalists themselves may be responsible for such a construal, for they too sometimes give the impression that they are engaged in the definition of the mental. Type physicalism is not initially proposed as definition of the mind, but as a scientific thesis which could be verified or falsified in the course of the development of science. In what follows I shall evolve a strategy for defending a version of type physicalism against the objections raised above.

70"What Is It Like to Be a Bat?" 400.
It must be admitted that if type physicalism is engaged in a reductive analysis of the mental, such analysis must be true under all possible circumstances. Critics of type physicalism are convinced of this fact. That is, a definition of the mental must hold in all possible circumstances and if it can be shown that we can conceive a world where the definition does not hold, then obviously the reductive analysis fails. For example, Nagel who provides an epistemological version of the qualia argument says: "It [the qualitative character of the experience] is not captured by any of the familiar, recently devised reductive analysis of the mental, for all of them are logically compatible with its absence" 71. I agree with the opponents of type physicalism that if the reductive analysis fails to capture what is essential to the mind, it ceases to be a definition of mind. A definition of mind is almost like a logical truth. Hence there should not be a world where this does not hold.

My defence of type physicalism is based on the distinction between two notions of possibility: logical and nomological. The above objections against type physicalism are the result of mistaking the latter for the former. The two notions of possibility may be clarified with the notion of possible worlds. There are logically possible worlds and nomologically possible worlds. Roughly, a logically possible world is one where the principles of logic are not violated. Usually, all those worlds which are conceivable are taken as logically possible. A nomologically possible world, on the other hand, is one where the laws of nature hold. As far as we humans, the inhabitants of the actual world, are concerned, all those worlds where the laws of our universe hold sway are nomologically possible. There may be other worlds with sets of laws that are radically different from ours. Such worlds are nomologically possible for the inhabitants of those worlds. But from our point of view, they are just logically possible worlds. A nomologically possible world does not violate any of the principles of logic. Hence the set of nomologically possible worlds is a subset of the set of all logically possible worlds. With the distinction between logical and nomological possibilities the type physicalist can meet

71"What is It Like to Be a Bat?" 392. Emphasis added.
the objections raised above. The type physicalists’ reply to the objection from the multiple realizability of the mental is that it stems from the consideration of various logical possibilities. The type physicalist can concede to his critics the logical possibility that a given mental type will be realised by certain physical types other than one that realises it among the humans. But the type-type identity thesis is not put forward as a logical truth, one that is true across all possible worlds. Rather, it is a scientific thesis with certain empirical commitments. Therefore, it is not refutable by arguing that the existence of possible worlds where such type-type identities do not hold can be conceived. Science never deals with the set of all possibilities. It is not concerned as to whether a given truth holds across all possible worlds. Its concern is with the set of nomological possibilities. The type physicalist makes only a minimal claim: given the laws of our universe, it turns out that each mental type is identical with, or better, is realised by some physical type. In other words, given the laws of nature, such as like causes produce like effects, it is highly unlikely that a given mental type can occur in any of the nomologically possible worlds, without the corresponding physical type. The function of psychology is to specify the laws that bind our psychological states and those of other species that are similar to ours in the relevant respects. We can attribute psychological properties to the members of the other species only if their nervous system resembles ours in the relevant respects. Obviously, our everyday ascriptions of mental properties do not depend upon the observation of any similarities in the central nervous system of the humans and those other creatures. However, such ascriptions are made on the ground that the behaviour of those creatures resemble ours. The intuition behind such ascriptions is that like causes produce like effects.

The above strategy can meet Kripke’s qualia argument against type physicalism. His objection consists in showing that there is no way to explain away the illusion of contingency associated with the if-true-necessary mind-body identity statements. Here again our strategy is to say that the if-true-necessary statements are not true across all possible worlds. Therefore, they are logically contingent. The
if-true-necessary statements are true only in those worlds which obey the laws of nature. That is to say they are necessary only nomologically and not logically. There are possible worlds where the laws of nature do not hold. In such a world, a qualitative mental state, say pain may be realised non-physiologically and perhaps even non-physically. That is to say, the contingency, associated with the if-true-necessary mind-brain identity statements can be explained easily: the if-true-necessary identity statements are nomologically necessary but logically contingent. But Kripke would object: Pain is a natural kind; so is C-fibre stimulation. Hence the predicate 'pain' and 'C-fibre firing' are rigid designators. And the law of identity is a logical principle obeyed in all possible worlds. Therefore the statement 'Pain = C-fibre stimulation' is true across all possible worlds and hence logically necessary. But this objection fails to take note of the meaning of the natural kind terms. The natural kind predicates are those which occur in the laws of nature. They refer to entities with a certain properties that are naturally given. In a world where the laws of nature do not hold, the meaning of natural kind predicates too differs. Hence the natural kind predicates in these worlds do not have the same kind of referents as they have in our world. Consequently, the statement 'Pain = C-fibre stimulation' may not be true at all in such possible worlds. That is to say it is logically contingent.\footnote{For Kripke, it seems that the expressions 'nomologically possible worlds' and 'logically possible worlds' would be co-extensive. Kripke is a \textit{de re} modal actualist who takes the possible worlds to be the various states of the actual concrete world we inhabit. Hence, the laws of our universe must hold other possible worlds as well. This is precisely the reason why he takes natural kinds to be rigid designators. But \textit{de re} modal actualism conceived in this manner has an odd consequence: It cannot distinguish between laws of logic and laws of nature.}

Nagel's epistemological argument against type physicalism cannot be met in the same way. The crux of his argument is the distinction between the subjective or species-specific point of view and the species independent or the objective point of view. The latter seems to be the point of view of an omniscient Cod. This distinction is modeled after or perhaps is a version of the distinction between ideas of primary qualities and ideas of secondary qualities. On Nagel's account, it seems, what it is
like to be a human 'being or what it is like to be a bat or martian is
determined by the secondary qualities of the organism (or the species) in
question. The secondary qualities are species-specific. On the other
hand, ideas of primary qualities are common to all species and there are
objective facts corresponding to them. These facts can be approached from
any of the various points of view. Nagel, for example, says that bats'
brains are designed to correlate the outgoing impulses with the subsequent
echoes, and the information thus acquired enables bats to make precise
discriminations of distance, size, shape, motion and texture comparable to
those we make by vision". The primary qualities are species-independent
and their concepts or ideas are common to all species. But the knowledge
of the objective facts does not provide us the knowledge of
species-specific points of view. There may be neural processes and states
responsible for the realisation of certain subjective experiences which in
part constitute what it is like to be humans. But the knowledge of these
objective facts does not provide us with the knowledge of what it is to
like to have those experiences. For this one has to undergo those very
experiences.

Our difficulty in knowing what it is like to have a subjective point
of view from our study of the objective facts that realises it, arises
because we approach the issue from the wrong side. It is Nagel's
assumption that a set of species-specific secondary qualities determine
what it is like to be a bat or martian or human, is the root cause of the
problem. The assumption is not a plausible one. It is not just the ideas
of secondary qualities that constitute what it is like to be humans.
Undoubtedly, they form a significant aspect of what it is like to be
humans. The ideas of primary qualities too have a role in determining our
conscious mental states, or what it is like to be humans. I speak here
only of the humans because the ideas of primary qualities that are
available to us belong to the humans alone. But do not the martians have
primary qualities? They may have primary qualities. But just as their
ideas of secondary qualities would vary their ideas of primary qualities.

73"What Is It Like to Be a Bat?" 394. Emphasis added.
may also vary. As a result, their understanding of the neural processes and our understanding of neural processes that realise human cognitive states could be radically different. For, the science we have is human science which is nothing other than *our* understanding of the nature of the world. Human science may not be anything like martian science.

But Nagel's martians are different from the martians we have just considered. They are attributed the same set of primary qualities that we humans have. They differ from the humans in their secondary qualities. Since the martians work with same objective concepts as we humans have, the martians — why even the bats — are human counterparts. Their point of view is, in fact, a part of the human point of view. In short, Nagel is not speaking of martians and bats but about humans themselves. We attribute human concepts and a cognitive system that is very much like ours to the members of the other species to the extent that they, or better their behaviour patterns, resemble ours in the relevant respects. This would mean that the laws, especially the psychological laws, that are applicable to us, must be applicable to the martians as well.

If the martians are radically different from us humans with a different type of cognitive system altogether, with species specific primary as well as secondary qualities, then it is true that their study of the human neurobiological processes cannot reveal to them what it is like to be humans, for their understanding of those processes would not be anything like ours. Moreover, they cannot say what these processes realise from the human point of view. The situation is not the same with the human physiologist who studies human neurobiological processes. Human neurobiology is a part of human science and, it is part of what it is like to be a human. The so called objective and the so called subjective points of view are accessible to him. The difference between them, for him, is only a matter of degree. Since both the "qualitative" and the "non-qualitative" aspects of human points of view are available to the human physiologist, he is in a unique position to say what the physiological processes are that realise a particular type of mental (qualitative) state. In other words, a mapping from the objective facts to the qualitative (or phenomenal) facts is possible as far as humans are concerned because the knowledge of the objective as well as the subjective
aspects forms part of what it is like to be humans. This is not to say that by knowing the physical processes responsible for the realisation of certain mental states we come to know what it is like to have those experiences. For that one has to undergo these very processes. But the goal of type physicalism is not to provide experiences by the study of the objective facts, but rather to understand the objective facts that nomologically realise these subjective experiences. This is possible because the subjective and the objective are part of one comprehensive species-specific point of view.

If the so called 'objective' and the 'subjective' form part of what it is like to be a human, we have already a comprehensive framework, though of course a species-specific one, which would identify the mental with the physical — a framework which includes the concepts of the things to be identified. This is not to claim that we are absolutely clear about the mental and the physical concepts. There is much more to be done in refining these concepts. This does not mean that the mental concepts will be reduced to the concepts of the physical. The identification of the physical processes that nomologically realise various mental states and processes is not a move towards reduction. A naturalistic and scientific understanding of psychology, as Chomsky notes, does not necessarily result in reduction but in the "eventual unification with the "core" natural sciences". "Large-scale reduction" he says, "is rare in the history of sciences. Commonly the more fundamental' science has to undergo radical revision for unification to proceed". If this is the way science proceeds, there is no reason to dismiss type physicalism on \textit{a priori} grounds. It can be refuted only on the basis of strong empirical evidence to the contrary. This suggests that type physicalism can be retained as a working hypothesis for pursuing scientific activity. It in fact tells us where to look for evidence, in order to achieve this unification. An inquiry in this line could result in the discovery of a new set of 'psycho-neural natural kinds*. This may require that neurobiology and psychology undergo radical revision and they may come up with new

\textsuperscript{74}Chomsky "Language and Nature." 3.
taxonomies of neurobiological as well as psychological kind terms. If we take seriously the logical possibility of multiple realizability in the scientific study of mind, that would be an impediment for the unification of psychology with natural sciences. For the possibility of heterogeneous realisation of mental types would not help us identify the candidates for the unification of psychological kinds with the physical types because each psychological type can be realised by infinitely many and heterogeneous physical types.

2.3.3.3 Objections to token physicalism

Of the two objections against type physicalism, neither the argument from multiple realisability nor any versions thereof can be raised against token physicalism for it grants in principle the multiple realisability of the mental. However, a version of Kripke's qualia argument could be raised against token physicalism. Events whether mental or physical are dated individuals. Since Kripke grants the transworld identity of the individuals, if a mental event is identical with a physical event, then it must be true in all possible worlds. So a statement identifying a mental event with a physical event, say "Jones' pain at \( t \) is Jones' firing of C-fibre C at \( t' \) is necessary if true. But we have a very strong philosophical intuition that Jones' pain at \( t \) is essentially a pain event, i.e., it could not have occurred without possessing its experiential character but is not essentially a physical or a neural event. We have similar intuitions regarding Jones' firing of C-fibre C at \( t \): it could have occurred without his feeling of pain. The truth of these two intuitions would entail that the mental event and the physical event in questions are distinct. Not to fall back upon dualism, the token-token identity theorist has to account for the intuitions of contingency without jeopardising the necessity of the statements identifying the mental and the physical events.

There are two ways of meeting this objection. The first is to maintain that while the events identified are necessarily self-identical, the mental event, Jones' pain at \( t \) is essentially a mental event and it could have occurred without there being his firing of C-fibre C at \( t \). The second strategy approaches the problem from the other side. It argues that
the physical event Jones' firing of C-fibre C at \( t \) could have occurred without its pain experiential character, though of course Jones' pain at \( t \), identified with his firing of C-fibre C at \( t \), is necessarily self-identical. The first method of explaining the intuition of contingency is adopted by Richard Boyd and Colin MacGinn. The basis of Boyd's strategy is to individuate mental events in terms of their formal properties. A token mental state, for Boyd, is purely configurational. The very same formal or configurational properties could be realised by a molecular motion other than the one that realises it in the actual world. In short, the argument is that a given token mental state could have multiple realisability.\(^75\) MacGinn makes a similar proposal. Let \( a \) be the name of a token mental state and \( Q \), the property of being identical with a token brain state. Token physicalism, in MacGinn's opinion, concedes the possibility that there exists a token mental state indistinguishable from a while lacking \( Q \). That is, a mental event in the actual world identified with a physical event is necessarily self-identical. Yet there could exist a world where the very same qualitative character could be realised by a different physical state. MacGinn illustrates this as follows:

In this respect, token mental states are like particular tables: they can be (and be essentially) of a type such that other tokens of that type fail to have properties which they, \textit{qua} tokens necessarily have.\(^76\)

The analogy reveals that Macginn like Boyd understands a mental event in terms of its formal aspects. But this method fails to meet Kripke's objection against token physicalism. We know that events are dated individuals. But both Boyd and MacGinn individuate mental events in terms of their formal aspects. The form of a particular event as abstracted from it ceases to be an individual event and turns out to be a universal having any number of instances. This means we have fallen back upon the idea that events of a given mental type could be realised by various physical means.


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In this respect, token mental states are like particular tables: they can be (and be essentially) of a type such that other tokens of that type fail to have properties which they, qua tokens necessarily have.⁷⁶

The analogy reveals that Macginn like Boyd understands a mental event in terms of its formal aspects. But this method fails to meet Kripke's objection against token physicalism. We know that events are dated individuals. But both Boyd and MacGinn individuate mental events in terms of their formal aspects. The form of a particular event as abstracted from it ceases to be an individual event and turns out to be a universal having any number of instances. This means we have fallen back upon the idea that events of a given mental type could be realised by various physical means.

The second of the two strategies for meeting Kripke's objections mentioned above is developed by Fred Feldman. Here too the concept of event plays the key role and Feldman defines events as concrete individuals which means they are necessarily physical. On this conception of event, it can be shown that a physical event identified with a psychological event could have occurred without being a psychological event. This means that the contingent psycho-physical event identity can be upheld. The contingent psycho-physical event identity thesis, according to Feldman, does not mean that for every psychological event e, there is a physical event e' such that e and e' are identical and yet there is a possible world in which e (or e') is distinct from itself. On the other hand, the thesis says that each mental event is a physical event which is not necessarily a mental event, (i.e., (e) $Me > Pe \& \sim N Me$; where N refers to the necessity operator).

For Feldman events are concrete individuals. Hence they are the same in all possible worlds. Yet, a concrete physical event identified with a mental event in the actual world could have existed without being a mental event. Let a be a psychological event, Jones' being amused and b, a physical event, Jones' having stimulated A-fibres identical with a. Feldman's argument is that b could have occurred without the occurrence of a. That is, there is a possible world in which Jones' brain could have been in exactly the same state at the same time without his being amused.

It means Jones' A-fibre stimulation is essentially a physical event, but not essentially Jones' being amused. Since Jones' being amused is the same event as Jones' having stimulated A-fibres in the actual world, it could be asked how Jones' being amused occur in a world, where Jones is not amused. Feldman replies as follows:

Being a case of someone's being amused may not be an essential property of that event. It may be a property that the event has in this world, but lacks in other worlds . . . Similarly, if the event a is only accidentally a case of someone's being amused, it can just as easily exist in a world in which no one is amused.78

78"Identity, Necessity, and Events," 154.
Feldman's strategy of meeting the objections presents its own difficulties. It assumes that the expression 'accidental property' and "contingent property" are equivalent. Though, of course, the accidental and contingent properties do not fall into exclusive classes, the two expressions are not co-extensive. All contingent properties are not accidental properties. There are non-accidental contingent properties. When an object possesses an accidental property, it means that its possession by the object has taken place at random or by chance. But the non-accidental contingent properties are those whose realisations are in accordance with the laws of nature. They are of course, nomologically necessary but contingent from an absolute point of view, meaning that they are not logically necessary. A contingent matter of fact is one which could be explained with reference to the laws of nature.

Feldman explains Kripke's intuition on the assumption that psycho-physical event identity is an accidental identity. It is clear from his argument that if "the thesis that every psychological event is a physical event, and each such physical event is such that it is only accidentally a psychological event, then the identity theory entails that Jones' being amused is only accidentally a psychological event. From this we can infer that it is only accidentally a case of someone's being amused". Since Feldman wants to establish contingent psycho-physical event identities, it is obvious that he uses the terms 'accidental' and 'contingent' as synonyms. If Jones' brain state could have been in exactly the same state without his being amused, then undoubtedly, his being amused is an accidental property of his brain state. But the accidental psycho-physical event identity theory has unwelcome consequences. Let $b_1, b_2, \ldots, b_n$ be Jones' brain events in the actual world, which are accidentally identical with his mental events, $m_1, m_2, \ldots, m_n$ respectively. If accidental psycho-physical event identity theory is true, then Jones' brain events $b_1, b_2, \ldots, b_n$ could have occurred without their being mental events. This means Jones could have existed in a world with

all the same brain events but at the same time having no mental events. I assume that Jones is a man. And it is the possession of a mind (i.e., the occurrence of mental events) that make him a man. Consequently, it is only by accident that Jones is a man. If it is true of one man, Jones, that he is accidentally a human being, then it is true of all humans, that they are humans only by accident. But no one would say that humans are humans only accidentally. Certain molecules and atoms constitute a human being because they are organised in accordance with certain laws of nature. That is to say, it is not an accident but a nomological necessity that we are humans, given the kind of laws followed in our creation.

In what follows I shall outline a way for explaining Kripke's intuition in line with our strategy for explaining the contingency of type-type identity statements. It is based upon the structural view of events which Feldman rejects out right. Events, according to this view, are complex structural entities whose constituents are properties, individuals and times. On this view, two events are identical if and only if they are structures containing the same property, individual and time. The event $e$ whose constituents are the individual $a$, the property $F$, and the time $t$, is identical with the event $e'$ made up of the individual $b$, the property $G$, and time $t_1$, if and only if $a = b$, $F = G$, and $t_1 = t_1$. Feldman rejects this view on the ground that it cannot explain how the proposition that someone is amused at $t$ if and only if he has stimulated A-fibres at $t$ is a contingent scientific hypothesis. On the structural view of events, the predicates 'is amused' and 'has stimulated fibres' occurring in the proposition express the same property. Since the predicates expressing the same properties are synonymous, it follows that 'is amused' and 'has stimulated A-fibres' are synonymous. As a result, token-token thesis ceases to be a contingent scientific hypothesis and becomes an analytic truth. The difficulty arises because identity is construed here as definitional identity. The problem can easily be resolved if by identity we mean identity of composition. If Jones is amused, then there are some neural facts responsible for his being amused, namely having stimulated

\[80\text{Cf. "Identity, Necessity, and Events," 149-51.}\]
A-fibres; though the senses of the expressions 'being amused' and 'having stimulated A-fibres' are different, both refer to the same physical processes in the actual world.

When we say that the event of Jones' being amused is the same as his having stimulated A-fibres, we mean that Jones is amused if and only if he has stimulated A-fibres. Here the connective 'if and only if is not to be understood as truth functional expressing a logical equivalence. Rather it is used nomologically; given the laws of nature, the property of being amused is the result of or is realised by the possession of the property of having stimulated A-fibres. In a different world where the laws of nature does not hold, there may be an individual similar to Jones whose has A-fibre stimulation but is not amused. Similarly there could be another logically possible world where a person similar to Jones is amused but has no A-fibre stimulation. The physiologist or the psychologist who is interested in psychophysical event identity thesis as a scientific hypothesis need not be concerned about logical possibilities. They need to be concerned only with the nomological possibilities. The question is: given the laws of nature, is it possible that Jones' A-fibre stimulation can occur without his being amused or could Jones' being amused occur without his A-fibre stimulation? The answer is no. If we take only nomologically possible worlds into consideration, type physicalism and token physicalism are equally strong: for each can entail the other. And each can explain the element of contingency associated with identity statements by appealing to the existence of possible worlds that are not nomological in the sense that the actual world is a nomologically possible world.

2.4 Conclusion

One of the main difficulties with the two substance theory of mind is that of explaining the causal interaction between substances of two opposing natures. Various versions of behaviourism tried to overcome this difficulty within the framework of materialistic monism by providing a relational analysis according to which mind is nothing over and above a system of relations between stimuli and responses. In this process it denied the ontological autonomy of the mental and instead conceived it as a
logical construct out of the stimuli and responses. This theory has consequences that are counter intuitive. It could not account for the mental processes (i.e., the causal interaction between various mental states) we are aware of. Physicalism tried to overcome the difficulties associated with the two substance theory from a different angle. It identifies mental states with the states of the central nervous system. Thus it could provide ontological status to the mental. It succeeded in explaining the mental physical causation and the causal interaction among the various mental states. However, it has a serious lacuna. It fails to explain how the mental states identified with the neural states could be about the world. Functionalism, the topic of our discussion in the next chapter successfully combines the positive aspects of both behaviourism and physicalism (central state identity theories) to emerge as the most powerful theory for the study of mind within the framework of materialistic monism. It accounts for the causal interaction among the various mental states and tries to explain how mental states would be related to the physical by granting causal relations among mental states, physical stimuli and behavioural response.