DISCURSIVE DEEP STRUCTURE AND

PHILOSOPHY OF MIND

A CRITIQUE OF PATRICIA CHURCHLAND'S NEUROPHILOSOPHY

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The question of how the brain represents its world, both inner and outer, has traditionally been construed as a philosophical question through and through, posed not in terms of the brain but the mind, and addressable not experimentally, but from the comfort of the proverbial armchair. Part of what is exciting about this epoch in science is that both of these assumptions have gradually lost their stuffing, and experimental science – the mix of ethology, psychology, and neuroscience – continues to press forward with empirical techniques for putting the crimp on these ancient questions. A corner that many philosophers thought was utterly unturnable has in fact been turned, if not in popular philosophy, then certainly within the mind/brain sciences.

The Computational Brain; PS Churchland and TJ Sejnowski pg.141

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PREFACE

Since childhood the brain and all aspects of it absolutely fascinated me. At a very young age I decided therefore to become a neurosurgeon, as this seemed at the time more romantic than other professions associated with the brain. I was fortunately given the opportunity to qualify as a neurosurgeon. After a while I found that although the profession was highly interesting it was not always challenging my interest in the higher functions of the brain and something was left dissatisfied.

This gave rise to my interest of early civilisations and when the opportunity arose I not only read about Egypt, Greece, Italy and so forth, but visited them. In Greece the importance of the philosophers made a lasting impression on me. On reaching retirement age, when time became available, I therefore decided to take an active interest in philosophy and as one thing usually leads to another, advanced to the stage where my old interest in the brain and its functions was stimulated — with the result that this study began to take shape.

Without the inspiration and interest of my supervisor Prof. Visagie the daunting task to undertake what has been produced in the form of this study for a M. degree, would never have been completed. We spent many hours discussing every single word written by me and patiently he has taught me the different ways to analyse and deliver a decent discourse. I am indebted to him.

I must also mention the other staff members, including Joey van Bosch the secretary, of the dept. of philosophy of the Univ. of the Free State for sometimes knowingly and at other times unknowingly, assisting in the production of this study. Not least I have a special word of thanks to Mrs. N.J. Lötter who did such splendid work in correcting the linguistic content of the study and correcting various other mistakes.

I must also thank my wife for the patience she constantly exhibited during this study and the many hours that she may have felt neglected to a certain extent. For even during our holidays many hours were spent on this undertaking. In closing I must also mention and thank my personal secretary for helping with the text printing and general care of the study.

In closing a work of advice to my professional colleagues, whilst in active practice, develop a second interest that can fulfil your days of retirement and save you from deathly boredom.

Chapter 1

1 OVERVIEW AND INTRODUCTION

1.1 *Introduction*

In the western world the Judeo-Christian tradition depicts humans as placed at the apex of creation and bearing the image of God. "Man" comes equipped with a soul attached to a physical body. This soul component is mostly identified (or overlaps) with functions that we commonly ascribe to "mind". The soul-mind thus experiences feelings, makes decisions, has consciousness, free will and all known other mental capacities.

Modern science holds the view that the universe is fundamentally physical and that it has existed and developed for billions of years without containing anything mental. Only in the most recent phase of evolution did agents with mental capacity evolve out of something physical. As each individual person develops, from a single cell containing a nucleus filled with DNA molecules, in a long and complicated but purely physical process, one positively expects mental phenomena to be simply just an expression of organised physical phenomena. The view acceptable to, and compatible with, modern science is that the mind is part of the body and thus in some sense physical. This is not accepted by all, especially not in religious circles. Also, the precise interpretation that should be given to the physicality of mind is something upon which philosophers and scientists sharply disagree. The most basic division here seems to exist between those who want a radical reduction of mind to physical brain structure and those who criticise such a total reduction for some other reason. Amongst the latter group we find those who consider the mind as truly irreducible, and those who are of opinion that the limitations of the human mind will not allow reduction.

In this treatise I shall begin by briefly sketching the historical debate on the basic questions of philosophy of mind. I shall then introduce Patricia Churchland and include a short summary of the different reduction theories with special reference to Churchland's criticism of them, leading to the theory of eliminative materialism and her concept of neurophilosophy. I shall analyse what I call the "discursive deep structure" of this neurophilosophy. This term refers to a certain level of theoretical discourse, at which the content of discourse can be said to find its origins in terms of factors like ideological commitment, basic ontological models, root metaphors and so on. Here I shall concentrate on three such factors, namely the conceptual key-formulas, the metaphors and models linked to them, and the paradigmatic or ideological frames in which they are conceptualised. Then, by way of a comparative perspective, I shall proceed to consider briefly comparable deep structures of some other philosophies of mind. The elucidation of comparable deep structures will also afford us a specific perspective on the reactions of others to Churchland's philosophy. Then I shall make an attempt to determine whether Churchland can be considered as active in the field of philosophy, or whether her work should be seen as an integral part of the field of science. Lastly I shall expand on some of my own concepts in the field under discussion, and express some personal opinions on different aspects in the so-called mind/body problem.

In terms of the literature that I will be reviewing in this study, let me point out that this is not an exhaustive analysis of everything that Patricia Churchland ever wrote. Rather I have attempted to single out certain specific parts of her discourse that lend themselves to the level of analysis that I wish to explore. Nonetheless I have made an effort to read as widely about Churchland as I could. For the sake of the interested reader I enclose a reasonably complete bibliography (at the time of my writing) of Churchland's writings, as a separate Appendix.

1.2 *The ongoing debate in philosophy of mind*

After the above overview let me now proceed to the basic historical philosophical context in which this study is situated. From J.C. Luce *(*1992*)* in a discussion of Greek philosophy, we learn that "nous" (something like an objective mind), for the pre-Socratics, Anaxagoras and Heraclitus, was the foundation of all the activities of the natural world. A pure transcendental intelligence, according to Plato, underlies the structural and dynamic order of the universe. Plato took the existence of mental entities, which could not be explained in physical terms, as the evidence for the independent existence of a realm of ideas. Even Aristotle, empirically minded, thought that purpose was to be seen in the inanimate as well as the animate world and that a transcendental intelligence, was behind all activity in nature. Democritus, a materialist, disagreed; he considered all things to be purely physical. Already, at the early stages of Western philosophy, there was thus debate on the existence of a non-physical existence or force.

During the sixteenth century the materialistic-mechanical viewpoint, characteristic of modern science, developed and had its influence on the thinking about the human mind. A protracted struggle between the Aristotelian view, which relied on the notion of the organism as its basic explanatory image, and the Neo-Platonic view, which took mind, mathematics and creative activity as basic explanatory image developed. Hobbes and de La Metrie, in the seventeenth century, had a naturalistic (materialistic) but very theoretical, approach to the mind/brain problem. Van Gelder's, *(1999:188)* more empirically orientated study became possible in the nineteenth century, largely by dint of advances in microscope and staining technology, an understanding of electricity, and the commanding scientific leadership exemplified in the successes of physics and chemistry.

As the sciences developed over the past 100 years, the body/mind problem received intense and sometimes frenetic attention, from different quarters:

psychologists, neurologists, philosophers, mathematicians, cosmologists and many others. Theories developed, were changed, found unsatisfactory and discarded: they were especially debated, sometimes heatedly so. Not only were these years exciting, they also were years of genuine progress. Knowledge of brain function and physiology exploded and gave rise to a new science: neuroscience. To enter the debate on the mind-body problem at least a basic knowledge of neuroscience has now become necessary.

The debate on the mind/body problem, which in a sense was started by Aristotle, *(1955),* came to the foreground with the theory of dualism proposed by the seventeenth philosopher-scientist Descartes in his sixth meditation. Dualism in one form or another is still accepted today by many, and of course makes good theological sense in spite of its problematic status in the scientific and philosophical world. Yet, the answer to the so-called "hard problem of consciousness" (a phrase coined by Chalmers) which is the nucleus of the mind/body problem, seems still a long way from the final answer. There is no doubt however that there is a link between the brain, a physical "object", and the mind, to which we refer in non-physicalist terms. It is the quest to illuminate the nature of this relationship that has given rise to the various theories on the mind-body problem and on consciousness, which are in existence today.

Let us now look a little more closely at the recent historical context. Cartesian dualism argued that mind and body must be separate "stuffs". This idea was expanded upon by the late nineteenth century philosopher Franz Brentano *(1973),* who believed that psychology, or scientific philosophy of mind, is the "science of the soul". This science is based on introspective experiments. These were later seen to be subjective and unscientific and produced no generally accepted data.

John Locke, in Chapter 27 of book 11 of his Essay "Concerning Human Understanding", propagates the view that the identity of persons over time consists of a certain sort of psychological continuity. *(1957)* This is compatible with the materialistic view that mental phenomena are always realised in, or constitutive of, physical phenomena. For Locke, qualia were a miracle, a proof of the existence of God. He believed that our ideas about matter are limited by our perceptions and because of this the true science of matter is beyond us.

Hume *(quoted by Fodor, 1994:38)* developed a representational theory of mind that included five points:

a) Ideas are a species of mental symbol.
b) Having a belief involves entertaining an idea.
c) Mental processes are causal associations of ideas.
d) Ideas are like pictures.
e) Ideas have their semantic properties by virtue of what they resemble.

The details of Hume's theory, resemblance as an explanation of semantic properties of mental representations, are not accepted by most psychologists today. The current idea is that the semantic properties of a mental representation are determined by aspects of its functional role.

Hume came to the conclusion that a person's mind is nothing more than the sequence of mental events - mental states - and a set of dispositions. He also noted that when we recollect a moment, the moment just past in our mental lives, we never recollect anything in any sense mental which is external to mental events. This is not to be considered a denial of the subjectivity of mental events.

Kant, with his *a priori* stance on knowledge, stressed the constitutive internal structure of the knowing faculty and thought that this structure

determined the limits of our knowledge. (Even today this view is supported by some, amongst others Chomsky.)

Ludwig Wittgenstein *(1958)* rid himself of Cartesian prejudices. His approach to the philosophy of mind was through his philosophy of language. He took a position that had elements of behaviourism as well as of functionalism, and this gave impetus to the development of different theories of mind.

In the 1920s and 30s philosophers began to adopt behaviouristic analyses of mental terms. It was the time of positivism: the only genuine knowledge was positive or scientific knowledge, and the only real method for gaining knowledge - including knowledge about all aspects of human life - was the scientific method of producing and testing causal hypotheses by reference to observation and experiment. This uncompromising pro-scientific and anti-metaphysical stance culminated in what became known as the *"Verification Principle"*. This principle stipulates that there are only physical events and that therefore only statements about physical events can really be considered true statements.

Positivism gave rise to behaviourism, which really took off when Richard Ryle published his book *The Concept of Mind* in 1949. Logical behaviourism (from observed behaviour, mental events are deduced) could not really explain psychological events and developed into philosophical behaviourism (a movement that still has its followers, and to which I will return again at a later stage).

In 1956 the philosopher–psychologist, U.T. Place, *(1956:44-50),* suggested that the mind is nothing but the brain. This idea gave rise to materialism, initially reductive materialism (better known as the identity theory). It seemed to be in tune with scientific materialism, the rage at the time, but

this approach did not seem to cope with certain major problems. It thus gave rise to a breakaway group, the eliminative materialists, who advocate the elimination of folk psychology (the psychological theories that ordinary experience of the world supposedly elicits) on the grounds that it is unscientific and misleading. Churchland and her husband Paul propagate eliminative materialism.

The development of computer technology has had a profound effect on recent work in philosophy of mind, and has been one of the inspirations of an approach called functionalism. An early exponent of functionalism, sometimes called computer functionalism, was the Harvard philosopher, Hilary Putnam. The basic principle in computerism, as it is known today, is that the mind is to the brain as a computer's software is to its hardware. This theory is supported because it is a literal account in terms of function; perceptual input, internal processing, and then output. To many this is an oversimplification of the concept of mind and its processes, and thus not acceptable. The theory, though, has a great many supporters.

Let me insert a personal note here. I am rather attracted to the theory of eliminative materialism as expounded by Churchland, and this can only be considered natural when my background is taken into account. As a retired neurosurgeon, I find that approaches to the mind-body problem based on neuroscience have a natural appeal. Churchland's work is based on neuroscience, of which she seems to have a more than adequate knowledge. I am also, however, of opinion that not everything is to be accepted at face value, and thus I have decided to make an indepth study of the discursive deep structure of her neurophilosophy.

Now I shall attempt to highlight some of the major conceptual conflicts that seem to be in the centre of the present debate. The major and most basic question on the mind-body problem is, and remains, the question of

whether the mental is just physical. Most thinkers active in the field hold the opinion that the mental and physical activities of the brain are separate but related. How to bring the two together is the major crucial problem in philosophy of mind today. The prevailing approach, in analytic philosophy, is some or other form of naturalism. (Basically this is the view that everything is in principle completely describable and explainable in the terms of the physical and biological sciences.)

Prominent amongst those philosophers who want to qualify the kind of naturalism at stake is Thomas Nagel. He says *(1994:65)* that "a theory which succeeds in explaining the relation between behaviour, consciousness and the brain would be of a fundamentally different kind from theories about other things: it cannot be generated by the application of already existing methods of explanation".

Current models of mental representation (especially that of Chomsky) ignore externalism (the doctrine that only objects perceived by the senses are capable of being judged real) by assuming, that representation is entirely a matter of internal properties. Yet there are others like Damasio *(2000:320)* who insist that the environment and the body itself play a major role in this regard. Searle, on the other hand, sees a certain attitude toward science as a fundamental mistake of naturalism. He objects *(1992:16)* to the "persistent objectifying tendency in contemporary philosophy, science and intellectual life generally."

In the same context Searle remarked *(1998:16)*: "We usually have the conviction that if something is real, it must be equally accessible to all competent observers." Since the seventeenth century, people in the West have come to accept an absolutely basic presupposition: that reality is objective. But of course the central problem here is that the premise that all

true knowledge must be phenomenally verifiable is in itself not verifiable in this manner.

Central to the present debate is the phenomenon of consciousness. Not only is it at this stage not possible to explain this phenomenon in terms of mechanical (chemical, physical, biological etc.) processes, but it is also seemingly impossible to define it or to describe it.

1.3 *Patricia Churchland*

The person and her work

Patricia Smith Churchland is at present Professor at the University of California San Diego, in the department of Philosophy. She was born on July 16, 1943 and is a U.S.A. citizen. She is married to Paul M. Churchland and they have 2 children. She obtained a B.A. (Hons.) in 1965 at the University of British Colombia, an M.A. in 1966 at the University of Pittsburg, and a D.Phil. in 1969 at Oxford University.

She was employed from 1969 to 1977 as assistant professor at the University of Manitoba, and thereafter as associate professor from 1977 to 1982 when she was also a visiting member at the Institute for Advanced Study, Princeton, in 1982 and 1983. She became a full professor at the University of Manitoba in 1983 and in 1984 moved to San Diego where she became full professor at the University of California, San Diego. Since 1965 she has received innumerable awards and grants for research, became an adjunct professor at the Salk Institute, and amongst other honours she has been elected to the Academy of Humanism and received an Honorary Doctor of Letters from the University of Victoria. Her fields of specialisation are philosophy of science and neuroscience, philosophy of mind, and environmental ethics.

From her pen there have flowed more than 50 articles dealing with neurobiology, consciousness, computerism and neurophilosophy. She has published the following books: Neurophilosophy: Towards a Unified Science of the Mind-Brain (1986); The computational Brain (with T.J. Sejnowsky) (1992); Neurophilosophy and Alzheimer's Disease (ed. by Y. Christen and P.S. Churchland) (1992); The Mind-Brain Continuum (ed. R.R. Limas and P.S. Churchland) (1992); On the Contrary: Critical Essays 1987-1997 (with Paul Churchland) (1998), Brain-Wise: Studies in Neurophilosophy (2002).

In the mid-seventies Patricia Churchland lost patience with mainstream philosophy's anti-scientific bias as exemplified in "linguistic analysis". She also did not accept any approach to science that excluded neuroscience as being relevant to an understanding of the mind, nor any approach to psychology that did the same. "Since I was a materialist and hence believed that the mind is the brain, it seemed obvious that a wider understanding of neuroscience could not fail to be useful if I wanted to know how we see, how we think and reason and decide" (Churchland, *1986:ix*). As a result of this opinion she studied neuroscience in detail; decided folk-psychology was to be rejected and came to the conclusion that eliminative materialism was the ontological theory available that was applicable. (She also supports connectionism.) Neurophilosophy then became for her the solution to the mind-body problem.

I will now briefly consider the different ontological theories and in this context illuminate her reasoning for becoming an eliminative materialist, before turning to neurophilosophy.

1.4 *Ontological theories*

After developing an interest in the mind-body problem, Churchland found it to be an ontological problem, posing a great number of questions. Some

of the questions in the foreground were the following: Will my "self" survive the disintegration of my physical body? What is the real nature of mental states and processes? What is a "mind" and what is consciousness? How does conscious awareness come about? There were many more questions like these. Churchland discovered that there are a number of theories at present that attempt to answer some or all of these questions but that only one theory would have the explanatory power, coherence and simplicity to satisfy her. She, as a materialist, eventually chose eliminative materialism, which is currently a prominent theory at the present. (As such it thus deserves the special attention that I shall attempt to pay it later on through a philosophical critique.) Eliminative materialism was preceded as a theory and grew out of a number of ontological theories to which she gave careful consideration before rejecting them. I shall now consider the main theories and her opinion of them. This is a necessary step in order to understand the precise origin of her ideological frame, a constituent part of discursive deep structure.

1.4.1 *Dualism*

The essential nature of dualism (in the present context) is that mind, consciousness and mental functions and processes reside in something non-physical. (Often denigrated by its opponents as "spooky stuff".) This theory came to prominence with Descartes, whose particular version of dualism identifies the mind with the conscious mind. It is deeply entrenched in most of the world's religions, and it is the most common theory accepted by the public at large although not by most of the scientific fraternity. Churchland *(1999:135)* summarises the theory as follows: "The mind, in the dualist's theory, is the ghost in the machine."

Churchland *(1998:180)* describes the problem of dualists in the following way: "To be more explicit about the dualist's dilemma, consider that, on a dualist conception, the self (or mind or what have you) has an intrinsic

unity — that is, a unity owed to the nature of mental substances rather than dependent upon the anatomical or physiological organization of the underlying brain. Indeed, for those dualists who believe that the self survives brain death, this is a crucial consideration. The brain may rot entirely, but the soul, argues the dualist, is immortal."

Dualism has support in two directions: substance dualism and property dualism. Those who conceive of the mind as a non-physical substance support substance dualism, believing that those mental states such as perceptions, thoughts, feelings and sensations are not of the brain but of a substance independent of the body. Some of the most renowned supporters of substance dualism are Plato, Descartes, and more recently R. Swinburne (1994:311-316). Substance dualists feel that neuroscience can shed light on the interaction between mind and body, but not on the nature of the mind itself. This also implies that to understand the mind we do not have to know much about the brain. Churchland (2002:47) thinks that "substance dualism chronically suffers from the lack of any positive description of the nature of the mental substance and any positive description of the interaction between the physical and the non-physical."

Property dualists have the conviction that even if the mind is the brain, subjective experience is emergent with respect to the brain and has a quality uniquely and irreducibly mental. Spinoza's solution to the problem, of mind and body is ingenious, although hard to understand in its entirety. He proposes in the second chapter of Ethics (1952:373-394); "The Nature and Origin of the mind", that the the mind and the body are one and the same thing, which is conceived now under the attribute of thought, now under the attribute of extension". The theory of the attributes implies not only that the one substance can be known in two ways, but that the same two ways of knowing apply also to the modes of that substance. The mind is a finite mode of the infinite substance conceived as thought; the body is a finite

mode of the infinite substance conceived as extension — and these two finite modes are in fact one and the same. While we can assert in the abstract that they are identical, we can never explain a physical process in terms of a mental one, or a mental process in terms of a physical.

Many contemporary philosophers who are materialists doubting the existence of soul-stuff nonetheless believe that psychology ought to be essentially autonomous from neuroscience, and that neuroscience will not contribute significantly to our understanding of perception, language use, thinking, problem solving, and (more generally) cognition. They think that psychological theory will not reduce to neuroscience because:

? the brain is too complex and neuroscience to hard;
? no functional (cognitive) process can be reduced to the behaviour of particular neuronal systems; and
? in cognitive generalisations, states are related semantically and logically, whereas in neurobiological generalisations states can only be causally related (Churchland, 1998:215-217)

Churchland (1998:216-217) does not accept these reasons as being valid and rejects them.

Her conclusion is that dualism is implausible and that it has fallen hopelessly behind cognitive neuroscience; it has not begun to forge explanations of many features of our experiences, such as why we mistake the smell of something for its taste, why amputees may feel a phantom limb, and so on. In truth, dualism does not even try. “To be a player, dualism has to be able to explain something. It needs to develop an explanatory framework that experimentally addresses the range of phenomena that cognitive neuroscience can experimentally address.” (Churchland, 2002:123). In this century, so her argument goes, modern neuroscience and psychology allow us to go beyond myth and introspection, to approach the self as a natural phenomenon whose causes

and effects can be addressed by science. Helped by new experimental techniques and new explanatory tools, we can pry loose a real understanding of how the brain comes to know its own body, how it builds coherent models of its world, and how changes in the brain tissue can entail changes in self-representational capacities.

1.4.2 *Philosophical behaviourism*

According to Paul. Churchland (1999:23): behaviourism is "a theory about how to analyse, or to understand, the vocabulary we use to talk about mental states (in their inner nature). Specifically it is to consider that talk about emotions, sensations, beliefs and desires, is talking about actual and potential patterns of behaviour." It claims that any sentence about a mental state can be paraphrased, without loss of meaning, into a long and complex sentence about what observable behaviour would result if the person in question were in this, that, or the other observable circumstance.

Behaviourists claim that most mental states are multi-tracked dispositions. In this view there is no point in worrying about the "relation" between the mind and the body. It is clearly consistent with a materialistic conception of human beings, but the fact that multi-tracked disposition can be grounded in immaterial mind-stuff remains possible but is not seriously considered by behaviourists. Paul Churchland *(1999:24)* is of opinion that some major flaws of this concept are that it ignores and even denies the 'inner' aspects of mental states (pains do have an intrinsic qualitative nature), and there is no finite way of specifying the conditions included for any specific analyses of a multi-tracked disposition.

Philosophical behaviourism must be distinguished from methodological behaviourism which urges that any new theoretical terms invented by the science of psychology should be operationally defined, in order that psychology may maintain firm contact with empirical reality. By contrast,

philosophical behaviorism claims that all the commonsense psychological terms in our pre-scientific vocabulary already get whatever meaning they have from operational definitions. It must also be distinguished from psychological behaviourism which has almost entirely given way to "cognitivism" in psychology. This is the view that one does explain behaviour through inner states and episodes as long as they are physical and that human beings are viewed in a sense as information processing systems. A typical approach will thus be the question of how information received through the sense organs is processed to give rise to intelligent behaviour. This approach Churchland finds to be close to functionalism.

1.4.3 *Functionalism*

Paul Churchland (1999:36) writes that "According to functionalism, the essential feature of any type of mental state is the set of causal relations it bears to:

1) Environmental effects on the body.
2) Other types of mental states.
3) Bodily behaviour."

Lycan states (1999:6) that "The functionalist mobilises three distinct levels of description but applies them all to the same fundamental reality. The theory is that a physical state-token in someone's brain at a particular time has a neuro-physiological description, but may also have a functional description relative to a machine program that the brain happens to be realizing. It may further have a mental description if some mental state is correctly type-identified with the functional category it exemplifies". Bodily damage or trauma gives rise to pain; it causes distress, and practical reasoning aimed at relief; and it is associated by reactions like nursing of the traumatised area, intake of breath, etc. Any state that plays exactly that functional role is a pain according to functionalism. Similarly, other types

of mental states (sensations, fears, beliefs and so on) are also defined by their unique causal roles in a complex economy of internal states mediating sensory inputs and behavioural outputs.

Churchland (1998:351) comes to a definitional interpretation: "The core idea of functionalism is the thesis that mental states are defined in terms of their abstract causal roles within the wider information-processing system." This differs from behaviourism. Where behaviourism hoped to define each type of mental state solely in terms of environmental input and behavioural output, the functionalists see adequate characterisation of almost any mental state, involving an in-eliminable reference to a variety of other mental states with which it is causally connected.

Paul Churchland (1999:37) states further that "The functionalists reject the traditional "mental type = physical type" equation but virtually all of them remain committed to a weaker "mental token = physical token" identity theory, for they still maintain that each instance of a given type of mental state is numerically identical with some specific physical state in some physical system or another." The qualitative nature, an essential feature of a great many of our mental states (pain, sensation of colour, etc.) is ignored by functionalism. It is therefore rejected by many. Paul Churchland feels that it can be considered a form of non-reductive materialism.

Functionalism can be divided into a at least two groupings: one group led by Jerry Fodor *(1987:xii)* states that human brains are like digital computers in so far as they are "semantic engines". That is, human brains operate by representing incoming perceptual information in a "language of the brain" (language of thought) in prepositional form. Fodor considers it a catastrophe if psychology or philosophy should give up the firm basis of psychological explanation in our commonsense belief-desire accounts. Another group, led by Daniel Dennett, argues that our ordinary belief-

desire vocabulary does not produce a vehicle for literal description of how the brain functions. His claim is that "the mind is the brain" and the mind is to the brain as a computer's software is to its hardware *(!993:33)*. In moving away from behaviourism, a number of philosophers moved towards artificial intelligence. Churchland however did not follow, because artificial intelligence did not include neuroscience: she found it a novel and sophisticated form of dualism.

Churchland *(1998:316)* compares functionalism to dualism in the following statement: "Here the orienting point is the hypothesis that the generalizations of psychology are emergent with respect to the generalizations of neuroscience and that mental states and processes constitute a domain of study autonomous with respect to neuroscience. Despite its explicit rebuff of dualists, this general position shares with dualism a dominant motivation that fixes on the presumed logical nature of reasoning, understanding, problem solving, and so forth." She furthermore added that "Functionalism is now the dominant theory of mind espoused by philosophers as well as by many cognitive scientists. Even so there are significant differences among functionalists on a number of issues, including the relevance of theories of brain function to theories of psychological function. Dissent from the methodological point of view is not without voice in cognitive psychology. My lot is thrown in with the dissenters, because I think both the anti-reductionist argument and the research ideology it funds are theoretically unjustified and pragmatically unwise to boot" (*Churchland, 1998:355)*

1.4.4 Materialism

Listed below are the central ideas that T.E. Horgan *(1995:471)*: holds to be constitutive of a materialist conception of human nature:

1) Humans are constituted by entities of the kind posited in physics. There are no Cartesian souls, vital spirits or entelechies.
2) The human body is a complete physico-chemical system; all events in the body and all movements are fully explainable in physico-chemical terms.
3) Any instantiation of any property by, or within, a human being is ultimately explainable in physico-chemical terms. [1]
4) Humans undergo mental events and states, and instantiate mental properties.
5) Much of human behaviour that is described as action is mentalistically explainable, not merely as raw motion.
6) Much of human mental life is mentalistically explainable.
7) Mentalistic explanation is a species of causal explanation; mentality is causally efficacious, both intra-mentally and in the aetiology of behaviour.

If materialism is true, then there must be some internal physical feature or other to which our discrimination of sensation, e.g. red, is keyed. The ”quale” of a feature can be a spiking frequency in a neural pathway.

There are two paradigms of materialism, the first reductive and the second eliminative. [2] Churchland is an eliminative materialist and eliminates “folk-psychology” theories by replacing them with “scientific theories” wherever possible. I shall now briefly differentiate between these two paradigms.

1.4.5 *Reductive materialism (also known as identity theory*

Paul Churchland (1999:26) writes that “Mental states are physical states of the brain. That is, 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.” The reductive theory claims that neuroscience will discover a taxonomy of neural states that

stand in a one-to-one correspondence with the mental states of our commonsense taxonomy. Claims for inter-theoretic identity will be justified only if such a match-up can be found.

Reductive materialists believe that neuroscience will eventually achieve the strong conditions necessary for the reduction of our "folk psychology" Churchland *(1998:299)* describes this in the following terms: "Now by folk psychology I mean that rough-hewn set of concepts, generalisations, and rules of thumb we all standardly use in explaining and predicting human behaviour. Folk psychology is common sense psychology." Reductive materialists base their conviction on pointing to the purely physical origins and ostensibly physical constitution of each individual human. They believe that the behaviour-controlling internal operations are precisely what the neurosciences are about.

1.4.*6* *Eliminative materialism*

Paul Churchland *(1999:43)* has formed the opinion that because it seems unlikely that one-to-one match-ups between the concepts of folk psychology and the concepts of theoretical neuroscience will be brought about by an adequate materialist theory, inter-theoretic reduction does not seem to be possible. He states that "folk psychology is to be considered not just an incomplete representation of our inner natures, but it also is an outright misrepresentation of our internal states and activities." He considers the common-sense psychological framework a false and radically misleading conception of the causes of human behaviour and the nature of cognitive activity. We must therefore expect that the older framework, folk psychology, will be replaced (eliminated) by neuroscience.

Paul Churchland *(1999:43)* continues: "Where identity theorists point to successful inter-theoretic reduction, the eliminative materialists point to cases of outright elimination of the ontology of an older theory, and the

replacement thereof by a new theory, considered superior." Examples of replacement are found in the disappearance of the phlogiston substance, the caloric substance and the Copernicus description of the movement of the heavenly bodies. Another example is the acceptance of witches. We thus have examples of both the observable and non-observable. It is an open question whether the concepts of folk psychology will find vindicating match-ups in a matured neuroscience.

Paul Churchland *(1990:120)*: finally defines eliminative materialism as follows: "Eliminative materialism is the thesis that our common-sense conception of psychological phenomena constitutes a radically false theory, a theory so fundamentally defective that both the principles and the ontology of that theory will eventually be displaced rather that smoothly reduced, by complete neuroscience."

For a further discussion I shall again return to the theme of eliminative materialism, this time to analyse the discursive deep structures at issue here, in Chapter 3.

1.5 *Connectionism*

Connectionism is one outstanding mechanism to achieve eliminativism and is defended by Churchland. At this stage it therefore warrants our close attention as it forms a major part of her approach to neuroscience and eliminativism.

For the past 30 years the classical view held by many was that human cognition is analogous to symbolic computation in digital computers. Connectionism is a movement in cognitive science hoping to explain human intellectual abilities using artificial neural networks (also known as neural nets). [3] Artificial neural networks are simplified models of the brain composed of large numbers of units (the analogs of neurons) together

with weights that measure the strength of connections between units. These weights model the effects of synapses that link one neuron to another. Already with these models the capability of such a model to be able to do face recognition, reading etc., has been demonstrated.

The classical belief is that cognition resembles digital processing, where strings are produced in sequence according to the instructions of a symbolic programme. The connectionist views mental processing as the dynamic with graded activity in a neural net, each unit's activation depending on the connection strengths and activity of its neighbours, according to the activation function. The connectionist (Churchland, *2002:300*) claims that information is stored in a non-symbolic way in the weights, or connection strengths, between units of a neural net. Some attempt has been made to reconcile this interpretation with the alternative by stating that the mind is a neural net, but it is also a symbolic processor at a higher and more abstract level of description. The idea is that connectionist research should try to discover how the machinery needed for symbolic processing can be reduced to the neural network account. Radical connectionists, though, would eliminate symbolic processing from cognitive science forever.

Units of a neural net are classified in three different types:

a) Input units (analogous to sensory neurons).
b) Intermediate units that process incoming information.
c) Output units (analogous to motor units) and the intermediate units to all other neurons. Each input unit has an activation value that represents some feature external to the net. An input unit sends its activation potential to each of the hidden (intermediate) units to which it is connected and thus the hidden unit's activation value depends on the activation value it receives. This value is then passed on to the output units.

The pattern of activation set up by any net is determined by the strength (or weight) of the connections between the units that are added together. Weights can be positive or negative. A certain threshold must be achieved before a motor unit is activated. Connectionists presume that cognitive functioning can be explained by collections of units that function in this way.

To build artificial networks and train them to function is an extremely difficult undertaking and includes, for example, training how hundreds of thousands of rounds of weight adjustments must take place. Furthermore back-propagation and connectionist learning methods which have to be build into the network may depend on quite subtle adjustment of the algorithm and the training set.

Examples of neural networks that master cognitive tasks are: NETtalk, a net trained by Rummelhart and Mc Clelland *(1986)* to predict the past tense of English verbs, and Elman's *(1989)* nets that can appreciate grammatical structure.

Connectionist models seem particularly well matched to what we know about neurology. The brain is indeed a neural net, formed from massively many units (neurons) and their connections (synapses). Neural network models suggest that connectionism may offer an especially faithful picture of the nature of cognitive processing. Connectionism promises to explain flexibility and insight found in human intelligence using methods that cannot easily be expressed in the form of exception-free principles.

A possible weakness of connectionism is that it moves away from many important and interesting features of the brain. It pays no attention to the different kinds of neurons, nor to the effects of neurotransmitters and

hormones. It is also not clear whether the brain has the ability of back-propagation and the immense number of repetitions needed for such training methods. Neural networks do not seem to be good at the kind of rule-based processing that is thought to undergird language, reasoning, and higher forms of thought.

Representations are distributed in the hidden units and are not localised to a single or specific small group of units forming a memory location. (This is used in the connectionist models) Representations are coded in patterns rather than firings of individual units. Every distributed representation is a pattern of activity across all units, so there is no principled way to distinguish between simple and complex representations.

Another complaint lodged against connectionism is that connectionist models are only good at processing associations, and that tasks such as language and reasoning cannot be accomplished by associative methods alone. This means that connectionists are unlikely to match the performance of classical models at explaining these higher–level cognitive abilities. A possible reply to this complaint is that connectionist models can be constructed to mimic a computer's circuits and thus can do anything that symbolic processors can do. Fodor and McLaughlin *(1990)* argue that in detail connectionists do not account for systematicity as seen in the activity of the human mind.

It thus becomes initially clear, and it will become still clearer later, why and how Churchland can be appreciative of connectionism. Part of the explanation in the context of discursive deep structure has to do with ideological analogies. When there are significant overlaps in the material content of the world views of such ideologies, it stands to reason that adherents of the one will try (in various degrees) to accommodate

perspectives from the other. Think for example of the relation between (various schools of) empiricism and behaviourism.

1.6 *Neurophilosophy*

More than thirty years ago philosophers were inclined to support the standpoint that if we seek knowledge of things we must turn to science. This standpoint developed with the success of science, and Wittgenstein, for example, took the view that philosophy could do no more than strive to undo the intellectual knots itself had tied, so achieving intellectual release, and even a certain illumination, but no knowledge. Since that time many analytical philosophers have swung back and now accept the view that philosophy has to attempt to play a part in giving an account of the most general nature of things and man. This swing back to first order questions was to a great extent due to a better understanding of the nature of scientific investigation. The philosopher has the skill to assess the worth of arguments, to bring to light the suppressed premises of arguments, and to analyse concepts. By using these skills further objectives can be achieved.

Churchland is an outstanding example in this context. To convince other philosophers of the relevance of science to philosophical issues she has had to argue against a concept of philosophy that places the latter over and against scientific findings that are by definition not relevant to philosophical problems. This isolation of philosophy is conceptually linked to the foundational position often ascribed to it. In the Kantian tradition this approach culminates in the search for *a priori* knowledge, or knowledge that is attainable without experience of the world.

To Churchland *(1998:ix)* the question was to whether it is "possible that we could have one grand unified theory of the mind-brain; and whether we can reconstruct all known mental phenomena in neuro-dynamical terms." This question became a driving force to Churchland, implying other questions

such as, what will such a theory would look like? Is a reductionist strategy reasonable or not? and so on. These then were the questions that drove her to neuroscience. But Churchland *(2002:ix)* found that she could not just take leave of philosophy either It also became evident to her that where one discipline ends and another begins, was no longer important.

The developments in neuroscience are relevant when the old philosophical issues of consciousness, mind, self, and the like are considered and re-evaluated. Churchland is basically a reductionist who believes that states of the mind, including consciousness, will eventually be explained in terms of neuron activity. "I am convinced that the right strategy for understanding psychological capacities is essentially reductionist, by which I mean, broadly, that understanding the neurobiological mechanisms is not a frill but a necessity. Adopting the reductionist strategy means trying to explain macro levels (psychological properties) in terms of micro levels (neural network properties)" (Churchland: 1995:1). The above arguments are the basis upon which she has established and propagates this new branch of philosophy, so called 'neurophilosophy'. When she and her husband Paul started their careers and their idea of neurophilosophy, there were some philosophers representing brain-based materialism (U.T. Place's *Consciousness is a Brain Process (1965)* and J.J.C. Smart's *Sensations and Brain Processes (1968)* but they merely mentioned the brain without bringing facts about its structure and function into their arguments. It was however a springboard for the idea of neurophilosophy. The idea of neurophilosophy was first broached by Paul Churchland in 1984 (reprinted 1999) in his book *Matter and Consciousness* and later exploited in *Neurophilosophy,* a book published by Patricia Churchland in 1998.

As neurophilosophers they argue that through materialism, satisfying theories can be developed about the mind through the interpretation of the currently existing knowledge about the brain's biology. They are convinced

that if we understand the physical, chemical, electrical, and developmental behaviour of neurons, and especially systems of neurons and the way they control one another, we will understand everything there is to know about the mind. Churchland *(1995:1)* states that "In assuming that neuroscience can reveal the physical mechanisms subserving psychological functions, I am assuming that it is indeed the brain that performs those functions — that the capacities of the human's mind are in fact capacities of the human brain. In saying that physicalism is a hypothesis, I mean to emphasize its status as an empirical matter". The central idea behind neurophilosophy, as created by the Churchlands, is that neuroscience is relevant to several philosophical issues, such as the mind-body problem.

The influence of Patricia Churchland and her husband's work in contemporary philosophy is unmistakable. Bringing neuroscience, neuro-computerism and philosophy together in an interdisciplinary way was of groundbreaking importance. R. N. McCauley *(1996:1)* points out that "The Churchlands are famous for carefully probing technical scientific research, regularly revealing its philosophically intriguing implications, and deftly integrating those results into their neuro-physiological and neuro-computational programs."

This is not to say that Patricia Churchland's attempt at neurophilosophy has not provoked criticism. The fact that I, like others before me criticise her work, must be regarded as part of the value of her work — it has caused others to think, to elaborate, and to seriously consider her writings and thus start a debate.

With the propagation of neurophilosophy as a specific direction in philosophy, Churchland advocates several distinguishable theses: Firstly, she quotes Kitcher *(1996:48)* in suggesting that "*D*irect study of the brain is likely to be very fruitful in the endeavour to get a theory of those aspects

of how the brain-mind works that is of special interest to philosophy" (contribution thesis). Together with other efforts this may be seen as an attempt to naturalise epistemology and introduce psychological realism into ethics. It follows that her central thesis is a more specific claim than the general commitment to naturalism: direct study of the brain will be fruitful in advancing understanding of cognition and the emotions. Secondly, Churchland at times advocates stronger positions, and states for example that "neuroscience must contribute essentially to the theoretical enterprise of a unified theory of the mind-brain that has implications for philosophy" ("*sine qua non*" thesis) *(Churchland, 1998:6).* Thirdly, Churchland views "neuroscience as more important in understanding those areas of mentality of interest to philosophy than other candidate disciplines, e.g. linguistics or cognitive psychology or philosophy itself." (P.Kitcher, *1996:48).*

It seems that Churchland's efforts to establish the first thesis is unsuccessful for the moment, as the search for higher level theories in neuroscience has turned out to be very difficult. To date traditional psychology has been more able to illuminate philosophical problems than neuroscience under both the "*sine qua non*" thesis and the "most important factor" thesis. Churchland supports the "*sine qua non*" thesis by pointing out the failure of folk theories, and hints at the failure of traditional psychology to contribute to the enlightenment of philosophical questions. However Kitcher *(1996:78)* expresses reservations about this*:* "The reflection about folk theories involves vitiating ambiguities, and the history of neuroscience has been just as disappointing as the history of psychology in discovering global theories of mental functioning." Though inter-theoretic reduction is seen by Patricia Churchland as the way in which neuroscience will contribute to solving the mind/body problem, Kitcher points out that reducing higher processes to relatively simple neurological or biological processes has not been that successful and has thus far not contributed to a unified theory of the problem.

There is no doubt however that neuroscience is important in understanding mentality and may play a much bigger role as it develops. Micro-level sciences are more likely than macro-level theories to produce quantum leaps in science. This makes a strong case for neuroscience but not necessarily for the three abovementioned theses of neuro-philosophy. Kitcher *(1996:78-79)* further points out that "The goal of unity of science may also be served by viewing the relations of explanatory dependence between psychology and neuroscience as symmetric; and the likelihood is that neuroscience will affect philosophy only indirectly."

1.6.1 *Neurophilosophy and psychology: Co-evolution*

Churchland is an exponent of the "co-evolution of theories" and of inter-theoretic reduction, and this is evident in her book *Neurophilosophy (1998)* which contains the most extensive discussion of reduction in the terms of the "co-evolution of theories" with special attention to the relationship between psychology and neuroscience. Co-evolution and inter-theoretic reduction underlies the eliminative materialism advocated by Churchland. Specifically she expects that development in the neurosciences will bring about the elimination not only of folk psychology but also other psychological theories that involve prepositional attitudes, including mainstream cognitive and social psychology.

Churchland *(1998:374)*: discusses three different "co-evolution" scenarios:

a) Neuroscience and psychology will both evolve in the direction of reduction "The co-evolutionary development of neuroscience and psychology means that establishing points of reductive contact is more or less inevitable."
b) Selection pressures exerted by science at the lower levels of the theory in question will have an overwhelming effect on the theory in question's

eventual shape.

c) Co-evolution in which the theoretical perspectives of two neighbouring sciences are so different that eventually the theoretical commitments of one must go.

McCauly *(1996a:22)* criticizes Churchland's approach as follows: "From the standpoint of traditional models Churchland proposes a form of *approximate* reduction, which falls well short of the logical empericist's standards, but which also suggest how true theories (e.g. the mechanics of relativity) can correct and even approximately reduce theories that are false (e.g. classical mechanics)." He also states *(1996b:6)*: "I argue that the earlier continuum model involves a decisive oversimplification that unjustifiably encourages their expectations about the elimination of psychology in the face of neuroscientific advances."

1.6.2 *Neurophilosophy: three rival ideologies*

Let us now turn to three approaches that can in some sense be seen to offer alternatives to neurophilosophy. Marshall and Gurd *(1996:176)* remark that: "Such full blooded reduction to a pre-modern physicalism as Patricia Churchland espouses is, we suspect, not too popular, either in the world at large or in the more restricted circles of professional philosophers and neuro-psychologists. For present purpose we can contrast reductionism with three rival ideologies, dualism, linguistic philosophy, and functionalism, the first two of which can be dismissed fairly speedily."

Dualism, according to Marshall and Gurd fails (agreeing with Chomsky) because modern physics has dissolved the concept of the body. In its turn, Marshall and Gurd write *(1996:181)*: "Linguistic philosophy sought to remove any link between mind and body because of the way we usually talk about the mental and the physical." The mental is described in one vocabulary e.g. "the pain is searing" and the physical in another vocabulary

e.g. “a nerve fiber is 1cm long”. Because of this incompatibility of vocabulary anyone who attempts to identify mind/brain states is accused of “conceptual confusion”. According to Marshall and Gurd *(1996:182)*, “functionalist theories of the mind draw their inspiration from the fact that engineering will not reduce to physics.” They argue that so-called “functional architecture” that underwrites our actions and memory depend on the study of patients with focal brain lesions who then have lost specific abilities: this in fact supports functionalist theories and not reductionism. A second argument in this context against reductionism is that there is not always a correlation between cerebral localisation and loss of function; sometimes identical losses are found with lesions in different locations. Functionalists have also drawn the analogy between computation within the brain and within computers and have argued that computation within the brain which happens in different locations can be compared to different computers reaching the same result in spite of their hardware and even their assembly language differing.

In terms of the three alternatives briefly summarised here, and anticipating the systematic analyses of Chapter 3, let me make the following side remark. If we again consider these three “ideologies” in the technical-theoretical context of discursive deep structure, one could point to an important difference in their make up. This is the fact that dualism unlike the other two represents more of a *type* of thinking that occurs throughout the history of philosophical thought. In contrast, linguistic philosophy and functionalism are clearly paradigms specific to a certain time slot in the history of philosophy. And it is in this latter sense that they will indeed be labelled “ideologies” in the philosophy of mind.

In closing this introductory chapter, one thing is clear, namely, that in her writings Patricia Churchland has dealt with a huge amount of scientific information, upon which she bases many different philosophical

arguments. As we have seen, she is convinced that scientific research does not substantiate traditional common sense beliefs about the mind and she argues that through "eliminative materialism" folk-psychological concepts (like popular conceptions of believe, think, see, etc.) will be displaced by scientific theories and ideas. In the world of philosophy Patricia Churchland can be said to represent a new paradigm, relating to the mind-body problem. She can certainly be counted among the foremost practitioners of philosophy of mind.

Notes:

[1] It is to be noted that these three assertions do not mention mentality and are considered thoroughly confirmed empirical hypotheses. Materialism however does take mentality seriously.

[2] The kind of "paradigms" that are at issue here, will be analysed later, in terms of discursive deep structure, as "ideologies". I am not interested in merely substituting names. It will be seen that "ideology" in this sense serves as a *technical* term within a defined theory (namely that of discursive deep structure).

[3] I do not go into the matter here, but in the context of discursive deep structure analysis, this is a (potential) ideological formation in the sphere of *theoretical philosophical* ideology. This latter sphere is distinguished from the sphere of *socio-cultural* ideology (including formations like capitalism, statism, ethno-nationalism and so on.

Chapter 2

CONSCIOUSNESS, SELF, FREE WILL AND COMPUTERISM: THE VIEW OF CHURCHLAND

Having explored in the previous chapter the basic framework within which Churchland's views developed, I would now like to concentrate on her handling of the four basic themes in this framework: Consciousness, Self, Free Will and Computerism. Here we will see how her broad approach is applied to some of the most vexing problems in philosophy of mind. It is especially in these themes that the aggressive materialism of her approach comes to the fore. In this chapter I shall also begin to express some of my own views on these themes. This will not yet necessitate having recourse to the critical apparatus of Chapter 3. To relate Churchland's framework to the specific themes referred to, some overlap with the previous chapter is unavoidable, although I have tried to keep this to minimum.

2.1 CONSCIOUSNESS

2.1.1 *Vexing problems*

According to Churchland the inability to define consciousness together with the inability to define memory, learning and other higher functions, hampers and complicates the study and interpretation of findings in neuroscience and psychology research. She maintains that we will one day find definitions if we use the same strategy here as we use in the early stages of any science: that is, we delineate the paradigm cases; and then try to bootstrap our way up from there. Thus to begin with, we must get provisional agreement on what things count as unproblematic examples of consciousness and begin by studying such cases, as well as cases where awareness has changed after specific kinds of brain damage. For

Churchland the possibility that a single paradigm will solve the mystery is not realistic.

Churchland *(1998:319)* says that it is because they are apparently non-physical, that reasoning and consciousness, and their kind, appear amenable to non-material explanations. Employing such explanations seemed far easier than finding brain-based explanations. Against the background of the previous chapter it is clear that Churchland's description of the mind as "non-physical" is only preliminary. Her ideal is to explain or reduce consciousness and mental activity to neurological activity, that is, to some physical process.

Churchland moves in this direction when she claims that folk-psychology's treatment of consciousness as a kind of light that is either on or off is wrong: consciousness is not a single type of brain process. We know that one can engage in a number of highly complex activities at once, even though not "paying attention" to them all. The brain undoubtedly has a number of mechanisms for monitoring brain processes; the folk-psychological categories of "awareness" and "consciousness" indifferently lump together an assortment of such mechanisms (*Churchland, 1998:321*). This is a clear indication of how complicated the subject of consciousness is, and that there is a strong relation with "sub-consciousness", a subject hardly discussed by the different thinkers within philosophy of mind. The whole complexity of brain activity around consciousness includes subliminal activity, which keeps us orientated as to the "self" and the world around us and this complicates matters even further. In my view the metaphor of light used here to describe consciousness is interesting but falls far short when compared with the characteristics of consciousness. It perhaps illustrates awareness, but leaves out experience, ability to interpret, to reason, and so on.

For Churchland none of the functions like attention, short-term memory, being awake, perceiving, imagining etc. can be equated with consciousness, but as we make scientific progress on each of these topics we are learning more and more of consciousness. Churchland *(2002:171)* maintains that: "In this respect the virtues of the indirect approach to consciousness may be analogous to the virtues of the indirect approach to the problem of *what it is to be alive.*" I agree with this statement and I see consciousness as encompassing various aspects of mind.

Churchland points out that sleep research has raised the question of whether there are different kinds of conscious states. She finds the answer to be that there are not only different kinds of consciousness but also different levels of consciousness, and these seem to be influenced, amongst other things, by the neural networks and action or absence of the neuro-transmitters.

Churchland agrees with Damasio when he highlights evidence that the following areas are important to consciousness and that small lesions in these areas can and will disturb it in some way: nuclei in the brainstem tegmentum, the posterior cingulate cortices, also the parietal cortex just behind them, the hypothalamus, and the intralaminar nuclei of the thalamus (*Churchland, 2002:168*). Small lesions in these areas result in coma or persistent vegetative state. Damasio is of the opinion that the capacity for consciousness is the outcome of high level *self-representational* capacities (*Churchland, 2002:164)*. This opinion of Damasio is summarised by Churchland *(2002:164)* as follows: "He is of the opinion that consciousness must be explained on the system level rather than the neuronal level." She is convinced that it must be explained at the neuronal level. Here we see Churchland's eliminative materialism deciding between the options of a systematic or a neuronal approach.

It is interesting to note that, in contrast to Churchland, Dennett records "global access is consciousness" *(Churchland, 2002:163).* He proposed *(!991:111) The Multiple Drafts Model* whilst Baars *(1988:42)* proposed the *Global Workspace* model of consciousness. The key idea to both proposals is that information is made accessible very broadly in the brain. Patricia Churchland *(2002:163)* critisises these two proposals: "Invaluable as metaphors are, they can seduce us into believing we understand more than we truly do. Secondly, the allure of the metaphor invites us to celebrate the data that fit and ignore the data that are awkward." [2]

2.1.2 *Consciousness and Neuroscience*

Churchland *(2002:135)* suggests that: "Perhaps consciousness is the product of interactions between a myriad of physical levels: molecular, single cell, circuit, pathway, or some higher organizational level not yet explicitly catalogued." In her book *Brain Wise (2002:319)* she describes several experiments undertaken by different researchers to localise visual awareness. The conclusion was that the data obtained suggested that a subset of neurons in visual cortical areas may support conscious visual perception. I want to note two things here. Firstly, certain areas are active with a visual stimulus but visual awareness, we must remember, is not general consciousness. Secondly, a question arises here: assuming that there are different types of consciousness, how can moral consciousness, for example, as such, be described as a physical product, assuming that physical interaction yields a physical product?

Crick (*quoted by Churchland, 2002:136*) assumes that there must be differences in brain activity when (1) a stimulus is presented and the brain is aware of it, and (2) a stimulus is presented and the brain is not aware of it. This is considered by Churchland an avenue to follow and the next step will be to find an experimental paradigm where psychology and neuroscience can hold hands across the divide. In other words, the problem

is to find a psychological phenomenon that fits Crick's assumption, and then to probe the corresponding neurological system to try and identify the neural differences between being aware and not being aware of the stimulus. Binocular rivalry is something that seems to be useful in this instance. The term refers to a state which occurs when each eye has a different visual input relating to the same part of the visual field. The early visual system on the left side of the brain receives an input from both eyes but sees only the part of the visual field to the right of the fixation point. The converse is true of the right side. If these two conflicting inputs were rivals, one would see the two inputs superimposed, but what happens is that one first sees the one input, then the other, and so on in alternation. For Churchland something like binocular rivalry presents an opportunity to explore the abovementioned relationship between psychology and neuroscience [2].

Let me move on briefly to another possible research topic in this regard. Churchland and others *(2002:149)* think that so-called back-projecting neurons are a feature of brain organisation generally. The loops (*re-entrant pathways)* thus formed, so the assumption goes, are essential circuitry in the production of conscious awareness. These loops or back projections are typical of cortical organisation and are also seen in the brainstem and spinal cord, as well as in structures such as the hypothalamus. It is considered that the long-axon neurons that connect the different brain lobes with each other play a crucial role here. Churchland admits, however, that although back projections are necessary for consciousness they are not sufficient.

Churchland, admitting that although there is an absolute absence of a firmly planted theoretical framework for understanding how the brain works, shows herself to be greatly interested in the supposition that neurons play a major role in consciousness. She *(2002:152)* points to the following facts emerging from the experimental literature:

- Neurons whose collective activity constitutes being aware of something are distributed spatially. Transiently they form a "coalition" that lasts for the duration of the awareness of a particular perception.
- Neurons in the coalition whose activity constitutes a perceptual awareness probably need to reach a threshold in order for the coalition's activity to constitute perceptual awareness.
- A coalition emerges as a sequence of synchrony of firing in neuron populations that project to the coalition members.
- Whenever neurons involved in perceptual awareness do fire above that threshold, they continue firing for a short but sustained period of time.
- Attention probably up-regulates the activity of the relevant neurons, getting them closer to the threshold.
- In awareness of a certain visual phenomenon some neurons will be activated as part of the cognitive background, whilst others will be activated as essential to the experience itself.
- At any given moment there probably is a competition between various essential-mode neurons to decide which neurons will fire at the threshold, and hence which representation one will become conscious of.

Again I would like to raise a critical question here. Accepting the fact that neuronal activity is involved in all aspects of consciousness, it is difficult to see how such activity can constitute (as neurologically described) what is meant for example by "being conscious of the historical significance of something". And this is important, for after all this is one of the characteristics that distinguishes human consciousness from mere animal consciousness. Even the perception of something like the Berlin Wall coming down is mediated by this kind of "higher" consciousness. It is

difficult to see how this kind of differentiation can be accommodated within the framework of eliminative materialism.

To get back to her main argument, however, Churchland *(2002:153)* concludes that: "Ideally, the items in this list will jell to form a kind of proto-theory of neural mechanisms supporting perceptual awareness. It will at least be valuable because it orients us toward thinking of the problem of consciousness in terms of *mechanisms*, that is, in terms of causal organization." [3]

According to Churchland *(2002:154)*, "correlations between neural activity and a subject's report of perceptual awareness are consistent with any of the following:

- Neural activity is a background condition for perceptual awareness.
- Neural activity is part of the cause.
- Neural activity is part of the sequelae of the awareness.
- Neural activity parallels, but plays no direct role in perceptual awareness.
- Neural activity is what perceptual awareness can be identified with." [4]

Ultimately what Patricia Churchland wants to establish is the identification of some class of neural activity with perceptual awareness. She is convinced that the indirect approach in solving the problem of consciousness proposes that once we understand the neurobiological mechanisms of each of these diverse functions and the relations between them, the story of consciousness will more or less come together on its own. This strategy favours continuing to investigate, both neuro-biologically and behaviourally, the diverse brain functions and how they connect with each other.

2.1.3 *The evolution of consciousness*

There is no doubt that Churchland and almost every scientist accepts that the brain and mental activity and function are evolutionary products. Previous ideas of genetics have been altered drastically since the development of molecular genetics, where it is proven that even small changes in the molecular structure of DNA composition can have a dramatic influence on the transmission of genetic characteristics whilst at other times this does not happen. (Churchland, *1998:364*). In this respect, Churchland appears to differ from Dennett and others who seems to be confined to transmission of genetic characteristics by genes as such. She supports molecular genetics and she is convinced *(1998:285)* that the "genes" as characterised in early transmission genetics, likened unto "beads on a string", do not exist.

Churchland *(2002:166)* sees neuronal structures and events as playing a part in evolution and her viewpoint is that when a certain class of neural events are represented as inner (e.g. pain) while others are represented as being of the outer world (e.g. those that can cause pain) a relationship is formed between the two. Churchland names this a "meta-representation" since they are higher order representations that are about lower order representations. She states *(2002:165)* that the richer neural architecture that has developed with evolution, enables second order evaluative structures, and second order planning and predictive planning. This permits richer comparison, evaluation, and learning and it allows me to sequence my self-representations in my plans to maximise my goal achievements. [5]

Of course one can ask why we have conscious experience of only some among a range of internal-signals like being conscious of a distended bladder but not of blood pressure. Churchland *(2002:167)* answers this question in the context of evolutionary biology as follows: "The answer

will depend on whether the type of state in question is one where it made sense for Mother Nature to permit the organism behavioural control and options." [6]

Churchland claims that the theory of evolution raises great difficulties for any theory on the origin of "soul stuff" (mind, consciousness etc.) and for questions like whether all organisms have it and whether it could have evolved from "physical stuff". For her the basic question is that if humans alone have minds, where did these substances come from? *(Churchland, 1998:320).* In my own opinion, evolution – as referred to in the above paragraphs – in fact leaves us with the mind/body problem, and does not play, at least at this stage, any part in solving the problem.

There is another issue that I would like to raise here. Churchland *(1998:388).* seems not accept that cognition as such is language-like She seems to fail to accept that the "language of thought" was probably in the early evolutionary stages not language-like, but was more likely "image-like", gradually developing, as language developed, into a mixture of image and language, "mentalese", which still is our language of thought today. Though this is a contentious issue, I would like to argue that a language of thought approach to the relation between evolution and the cognitive part of consciousness is the most fruitful approach.

As a reductionist, Churchland *(1998:321-2)* is convinced there is no separate existence of the mind, and that there is at present no evidence to the contrary. She holds that modern evolutionary biology provides a plausible and unified story of the development of intelligence, and because substance dualism entails arbitrary and unmotivated exceptions, separate existence of the mind cannot be supported.

2.1.4 *Consciousness, reduction and the mind-body problem*

Whether mental states are reducible to brain states, depends on a theory describing how neuronal ensembles work, and whether it reduces in such a way that the mental states can be identified with neuronal states. Again the question that emerges here is whether the approach that Churchland defends, namely to reduce consciousness and mental function to brain function, is plausible? Alternative questions are whether mental states are related to brain states, and whether they are causally related?

For Churchland there are many objections to the possibility of a unified theory of the mind-brain that depend on the assumption that the common-sense understanding of consciousness, beliefs, desires and other mental states is correct. She states that to overcome these objections means that: "We should acknowledge the necessity of relaxing our conviction concerning the basic correctness of our understanding of the mental" (*Churchland, 1998:282).* This can only be achieved if there is indeed something substantial to replace it. We have seen that she is convinced that folk-psychology is mostly wrong or misleading and that one must approach it with mistrust.

My own view is that common sense and experience give rise to concrete ideas and when these differ from scientific-theoretical knowledge, which is aimed at the abstract aspects of the world these concrete ideas cannot summarily be discarded. We should not forget that the departure point of most scientific theories and investigations is indeed "folk-theory", although the latter may be proved to be wrong in the course of scientific investigations. The point, however, is that a theoretical state of mind cannot replace our everyday experience of the world. There is a truth to the latter experience (on which our everyday lives depend) that science should not negate but account for.

Let me turn now to the issue of consciousness in the sense of awareness. Churchland *(1998:306-307)* draws our attention to the fact that whenever we perceive something in the external world, complex information processing underlies ostensibly simple and "direct" perceptual judgments, yet there is no awareness of a period of calculation and reasoning. The same applies to observation of mental states. This processing activity, taking place unconsciously, may possibly be compared to computer activity. There is no doubt that this information processing involves a very large part of the brain, and that an intact neuronal network is necessary. As to the problem of awareness, Churchland *(1998:307)* holds that: "Certainly there is a learned component in the recognition of mental states, though presumably there is an innate mechanism for such learning. Awareness (being consciously aware) of inner states is a type of perception that is directed internally rather than externally, and the observational predicates employed in recognition of mental states enjoy no special status." "Innate mechanism for learning" of course calls to mind an idea Chomsky also advocates, namely that such mechanisms must be present for a child to be able to learn a language for example. It must also be considered a hampering factor where such a mechanism is not present.

Churchland proceeds to question the notion of awareness in a more radical fashion. She voices doubt that there is such a thing as "awareness", stating that "Some future theory may characterize it in a quite different way".*(Churchland, 1998:309)* Again she raises serious doubt as to the reliability of folk-psychology. And once more I must point out that she tends to regard everyday folk-psychology as a specific theory, which has been, or will be, proven wrong by a better theory.

Churchland's approach to consciousness in physicality terms, has been to fend of the objections off those who raise the nature of linguisticality itself. Contemporary philosophers who support substance dualism, according to

Churchland *(1998:318)* claim: "Put forward the argument that the *meaningfulness* of sentences in reasoning, and the *logical* relations between sentences used in reasoning, eludes an explanation in physicalist terms." Churchland *(1998:318)* does not accept this: "An intractable problem confronting substance dualism concerns the nature of the interaction between the two radically different kinds of substance. Soul-stuff allegedly has none of the properties of material stuff and is not spatially extended, and the question therefore concerns how and where the two substances interact." My own opinion is that meaningfulness is an important part of consciousness and comes into play after awareness. The former indicates that a further step in consciousness has taken place, namely the ability to reason about what one has become aware of. These processes all take part in the brain and must rest on a physical basis, the mechanism of which is at the moment unknown (and it may well be that it will remain unknown).

Let me turn to another argument that has been raised against a physicalist model of consciousness. This is the claim that experience, a major component of consciousness, is subjective and confined to the person who has the experience. Churchland *(1998:327)* replies that the qualities of subjective experience are nevertheless emergent with respect to the brain and its properties. It is true that "emergence" of qualities without scientific explanation, is not a generally accepted theory, and Churchland acknowledges the property dualist's claim that if subjective experience is emergent, this makes the reduction of folk-psychology to neuroscience impossible.

Property dualists claim that subjective experiences are produced by the brain and can in their turn affect the brain, but that they are not themselves identifiable with any physical properties of the brain. Supporters of this view state that we cannot say for example that feeling sad is a neuronal configuration in such and such a neuronal ensemble. Yet, we know that a

state of depression is explained by cerebral malfunction due to a problem with the transmitter substances, thus a disturbance of the neuronal configuration. It can be argued however, that if the neuronal network is defective or not functioning for some reason, one can also not experience anything in the normal way and that one's consciousness is disturbed.

Churchland *(1998:326)* does admit that in the history of science, subjective experience has not been successfully identified with and explained by states and processes in the brain. However she is adamant that subjective experience and brain states are influenced by transmitter substances, and that neuroscience is advancing in the direction of closing the gap between certain brain states and experience - feelings like sadness and depression for instance.

Finally, let me briefly mention Nagel's well known defence of the irreducible nature of subjectivity. Churchland *(1998:327)* acknowledges Thomas Nagel's position that one has a subjective point of view when it comes to one's experiences. It is the *qualia* or qualitative character of experiences, sensations, feelings, and so forth, to which we have introspective access, and it is this that, in Nagel's view, is not reducible to neural states. Churchland *(1998:327)* replies that: "The argument does exert a powerful attraction, but as stated it is still teasingly vague." And that "I have no wish to deny introspective awareness of sensations. The properties of my brain states are not known-to-me-by introspection looks decidedly troublesome. Its first problem is that it begs the very question at issue – that is, the question of whether or not mental states are identical to brain states".*(Churchland, 1998:328)*

It is my opinion that the problem with Churchland's approach is that the state of mind, i.e. elation, depression and even states of the "body" (like tiredness), will influence our thoughts, feelings and sensations from the

"inside". On the other hand, accepting that the state of our "mind" is determined by neuronal processes, the two ("inside and "outside") can therefore not be totally divorced from each other.

A final remark: in her writings, Churchland does not pay much attention to the theory that quantum mechanics plays an important role in consciousness and in neural biology (as proposed by Penrose, Hameroff and others). It is her opinion that the problems of the macro-properties of the complex atoms cannot at this stage be solved by quantum mechanics, because the necessary mathematics is not available and whether this will be developed in the future, is an open question. She does acknowledge that quantum mechanics has already solved many questions, but foresees that advances in neurology will continue in spite of mathematical shortcomings. The important point is that the general outlines of the reductive story are in place. She also points out that the idea that mathematics may solve reduction problems is not new, having already appeared in the Greek philosophy (*Churchland, 1998:286).*

2.2 THE SELF

2.2.1 *Clarifying the issues.*

Frequently we use "self" to mean body, as in "I cut myself"; on other occasions, we mean to distinguish self from body, as when you are exhorted, for example, to "talk to yourself". This indicates that when we think about ourselves we have two different aspects that come into consideration. Yet there is no doubt that these two are closely connected (the body and the mind) and that they influence each other tremendously and are basically inseparable. Nowhere do we find the mind and body closer together than in our thoughts; to each of us they are one; they constitute *me; myself.*

Churchland *(2002:62)* notes that in conversation about the self and in thinking about the self, a diverse number of metaphors are used. For example:

- Object metaphors, such as: we pushed ourselves to the limit, pulled ourselves together.
- Person metaphors, such as: one's good self or one's bad self, or one's real self.
- As a "project" metaphor, such as when an effort is made "to improve the self."

For Churchland this suggests that the self is not a thoroughly coherent, single, unified representational scheme about which we have thoroughly coherent, unified beliefs. The fundamental capacity of the self, however, consists in coordinating needs, goals, perceptions, and memory with motor control. Churchland *(2002:59)* summarises the problem of the self as follows, "I am about as real as things get in my world. What exactly is it that the brain constructs that enables me to think of *myself*?" [5]

In reviewing reflections on the self that one encounters in philosophical thoughts, Churchland recalls Descartes first of all. He made the well-known proposal that *(quoted by Churchland 2002:59)* "The self is not identical with one's body, or indeed, with any physical thing." Instead, he concluded that the essential self – the self one means when one thinks "I exist" – is obviously a *non-physical, conscious thing*. David Hume *(Churchland 2002:59)* formed the opinion that "What one can introspect is a continues changing flux of visual perceptions, sounds, smells, emotions, memories, thoughts and so forth, but among all those experiences however, there does not exist a single, continuous felt experience that one can attend to and say: "that's the self." In reflexion, we take for granted however that a single thread of "me-ness" runs through the entire fabric of one's experience. This gives rise to Hume's conundrum which we can summarise

as follows: I think I am something, yet my self is not anything I can actually observe, at least in the way that I can observe pains, or fatigue or my hands or my heart. So if my self is not an identifiable experience, if it is not something I can observe, what is it? Is the self a mental construction. a mode of thinking about my experiences? Then the question arises, what are the properties of this construction, and where does this construction come from? [6]

Churchland *(2002:61)* is reasonably sure "That thinking is something the brain does. Therefore, *thinking of oneself as a thing* enduring through time is also something the *brain* does. At least in very general terms, she thinks, we therefore have an answer to Hume's question concerning where the constructed *self* comes from: the brain."

Therefore in her opinion *(2002:61)* "Such unity and coherence as there is in my conception of myself *as a self* depends on, amongst other things, these biological facts:

- My body is equipped with one brain;
- body and brain are in close communication; and
- activity in diverse parts of the brain is coordinated at a range of time scales, from milliseconds to hours."

Again seeking to bring evolution into the picture Churchland *(2002:62)* writes that "Evolutionary biology, moreover, suggests a very general answer to the question of why brains might construct a self-concept: it plays a role in the neuronal organization used to coordinate movements with needs, perceptions, and memories. Such coordination is necessary for survival and well-being."

Churchland *(2002:63)* is of opinion that "Such co-ordination does not presuppose a self which is a thoroughly coherent, unified, single

representational scheme about which we have thoroughly coherent beliefs. Rather, the self is something like a squadron of capacities flying in loose formation." Depending on the context, it is one or another of these capacities, or their exercise, to which we refer when we speak of the self. To me it seems as if Churchland, when dealing with the self, has a need to emphasise multiplicity (which certainly is there) at the cost of unity. The squadron metaphor, ironically, while illustrating multiplicity, also points (correctly) to the unified and unifying character of the self. [7]

A brain builds on the fact that animals first and foremost are in the moving business: to feed, flee, fight and reproduce by moving their bodies. Consequently an overarching demand on any nervous system is that it coordinates the body; its moveable parts, its needs, its stored information, and its incoming signals. Evolution of neural organisation favoured survival. This type of coordination can only be performed by neurons since there is no intelligent "mini-me" inside who puts it all together. Churchland; *(2002:71)* explains that "The intelligence of the system has emerged out of the *patterns* of neuronal connectivity, the *response properties* of particular types of neurons, the activity dependent *modifiability* of neurons (learning) and a neuronal *reward system* for strengthening neuronal connectivity when things go well and weakening connectivity when things go awry."

Hume's problem is recast by Paul Churchland *(1990:133)* in terms of representational capacities "This removes the temptation to lapse into supposing that the self is a *thing*, or if it is a representation, that it is a *single* representation. Self- representations may be widely distributed across brain tissue, coordinated only on an "as needed" basis, and arranged in a loose hierarchy. Adopting the terminology of representational capacities facilitates the formulation of specific questions about the neural

components that play a role in some particular self-representational capacity or other."

2.2.2 The self and neuroscience

Representations of inner knowledge, like outer knowledge, are conceptually and theoretically mediated —they are the result of complex information processing in the brain. On the hypothesis that the self is actually a loosely-connected set of representational capacities, as Churchland holds, we need to know in terms of neuroanatomy and neurophysiology what representations are. Churchland *(2002:63)* moves in this direction when she writes "Self representations may be widely distributed across brain tissue, coordinated only on a "as needed" basis, and arranged in a lose hierarchy." She adds that "The terminology of representational capacities facilitates the formulation of specific questions about the neural components that play a role in some particular self-representational capacity or other." [8]

Continuing along this path Churchland *(2002:64)* states that "Representations are states of the brain, such as *patterns of activity* across groups of neurons, which carry information." She continues: "We may consider a representational model to be a coordinated organization of representations embodying information about a connected set of objects and what happens to them across time." She continues still further *(2002:64)*: "The brain not only represents the sensations of one's limbs; it specifically represents the sight and feel of the limb *as belonging to* oneself. (There is a mosquito on my left ear). Yet further neuronal activity may represent that presentation as a mental state (I know I feel a mosquito on my left ear.) One's brain also has a model of one's preferences, one's skills, one's memory, even when one is not now exercising those preferences and skills."

Another aspect that Churchland considers is the lack of sharp boundaries on this level. Self-representation, she maintains, comes in grades, degrees, shades and layers, and is not an all or nothing affair. Also, certain "self representations" may wax and wane, depending on neurochemical and endocrine conditions.

Let me now make a final remark in the present context. An aspect of self-construction that Churchland seems to ignore is the one that for example, a philosopher like Habermas or Charles Taylor emphasises, and even overemphasises: the socialisation that shapes the self, in terms of the macro building blocks of reality such as nature, knowledge, power/culture personhood and society etc. Churchland fixates on the element of nature. But can an adequate concept of the human self be formed by way of such one-sided abstraction?

2.3 FREE WILL

2.3.1 *The determination of choice*

One agrees with the vision of Churchland that much of human social life depends on the expectation that agents have control over their actions and are responsible for their choices and that as members of a social species we should make the right choices like cooperation, loyalty, honesty, and helping each other when the occasion arises. In daily life it is assumed that it is sensible to punish or reward behaviour provided the person was in control and chose knowingly and intentionally. Generally we do accept that we have the ability to choose freely under normal circumstances. Do we however really have free choice and a free will?

Much of our behaviour is guided by the expectation of specific consequences of events in the physical and in the social world. This influences our decisions and we may thus be compelled to make certain choices that we would do differently were there no such considerations.

Can those choices be considered fully free choices? Libertarianism (those who support total freedom in the sense defined by the philosopher David Hume) only accept a choice as free when it is absolutely uncaused and without prior constraints.

Hume in *A Treatise of Human Nature,* 1793, thought this was not possible and that responsible choice is inconsistent with libertarianism. Hume argued that our free choices and decisions are in fact caused by other events in the mind. He went even further and decided that agents choices are not to be considered freely made unless they are caused by his desires, intentions, and so forth; while for attribution of responsible choice randomness, pure chance, and utter unpredictability are not preconditions. Also it is not necessary that the agent be aware of what causes his actions. He concludes that "Where actions proceed not from some cause in the character and disposition of the person, who performed them, they infix not themselves upon him and can neither redound his honour if good, nor infamy, if evil." In general a choice undetermined by anything the agent believes, intends or desires is the kind of thing we consider out of the agent's control and thus not the sort of thing for which we hold someone responsible.

Getting back to Churchland, it appears that she is fundamentally sympathetic to Hume's perspective. Indeed, one might have guessed views would tend in this direction given the internal ideology of eliminative materialism. Churchland *(2002:204)* states that "Neither Hume's argument that choices are internally caused, nor his argument that libertarianism is absurd, have ever been convincingly refuted."

2.3.2 Free will and neuroscience

Churchland *(2002:204)* makes the connection between Hume and modern neuroscience when she writes that "The brain does indeed appear to be a causal machine and so far there is no evidence at all that some neural events happen without any cause." Accepting that neural events have a cause, causality does not entail predictability, and unpredictability does not entail non-causality. We are told that brain events relevant to decisions and choices are probably all caused events. She stresses that the crucial point, however, is that not all kinds of causes are consistent with free choice; not all kinds of causes are equal before the tribunal of responsibility.

Questions that now face Patricia Churchland are:

- Are there systematic *brain-based* differences between voluntary and involuntary actions that will support the notion of agent responsibility?
- When, if ever, is it fair to hold an agent responsible?
- When, if ever. is punishment justified?
- Can introspection - attentive, careful, knowledgeable introspection - distinguish those internal causes for which we are responsible from those for which we are not?

Aristotle, *(1995)* in *Nichomachean Ethics,* pointed out that for an agent to be held responsible, it is necessary that the cause of an agent's behaviour must be internal to the agent, i.e. there must be intent. Actions produced by coercion and actions produced in certain kinds of ignorance he characterised as "involuntary". To Patricia Churchland *(2002:211)* "it increasingly seems unlikely that there is a sharp distinction - brain based or otherwise - between the voluntary and the involuntary, between being in control either in terms of behavioural conditions or in terms of the underlying neurobiology."

Some desires or fears may be very powerful, others less so, and we may have more self control in some circumstances than in others. Control thus must be considered as coming in degrees, according to Churchland, hence as falling along a spectrum of possibilities; cases at the top and at the bottom of the spectrum will provide a basis for a distinction between being in control and not, between freely choosing and not, between being responsible and not. At the present moment we do not know how to specify all the parameters or how to weigh their significance. We do know however that activity in certain brain structures, e.g. the anterior cingulated cortex, hypothalamus, insula and ventromedial frontal cortex, are important. Additionally we know that the levels of neuro-modulaters, such as norepinephrine and acetylcholine, and neurotransmitters such as serotonin and dopamine, play a role, as well as various hormones such as oestrogen and testosterone. I am of the opinion that since all these and many more play a role in decision making, the question of free will deepens even further.

In matters of practical decision, reason and emotion often are in opposition. To achieve control one must suppress emotions, feelings and inclinations. Churchland *(2002:221)* expresses the opinion that Kant, the philosopher best known for favouring reason, held in his moral philosophy that decisions of moral nature should be perfectly rational and without emotion. David Hume *(1896:413)* disagrees: "Reason alone can never be a motive to any action of the will; and secondly, it can never oppose passion in the direction of the will." Churchland *(2002:221)* again opts for Hume, explaining that "As Hume understands it, reason is responsible for delineating the various consequences of a plan, and thus reason and imagination work together to anticipate pitfalls and payoffs."

It will by now be apparent that I think Churchland's whole neurophilosophy is based on a certain key conceptual structure. A critical

evaluation of her standpoint on free will is inextricably bound up to such conceptualisation, and I will attempt to lay the latter bare in the next chapter. Our findings there will indeed (by implication) raise some critical questions regarding her view on causality and free will.

2.3.3 *Brain structures and decision making.*

Churchland *(2002:231)* accepts a finding of Damasio when examining brain-damaged subjects, that when the amygdala are destroyed such a patient has no fear, and also that when the ventro-medial part of the frontal lobe of the brain is destroyed, the subject has normal intelligence, reasoning powers etc., but that such a person cannot complete an undertaking, and there is a disconnection between emotions and judgement. This is based on the fact that neurons in the ventro-medial frontal cortex project to and from areas such as the anterior cingulate cortex, amygdala, and hypothalamus, which contain neurons signalling body-state values. Should the ventro-medial cortex of the frontal lobe be destroyed, these pathways are disrupted and the frontal lobes have no access to information about the emotional valence of a complex situation, plan or idea needed for complex decisions. Should prefrontal lesions occur early in life (before age 16) IQ etc. will be normal but there is severe impairment of social behaviour due to the emotional disruption.

Churchland *(2002:228)* agrees with Damasio and other researchers that emotions play an ongoing and indispensable role in formulating practical and wise plans, both long-term and short-term, and forms an agency of self representation and consciousness. Emotional responses to internally driven scenarios as well as perceptually driven scenarios are generated via mediation of the brainstem structures, amygdala, and the hypothalamus. The various emotions have a central role in evaluating options and their consequences as threatening, rewarding, dangerous, risky, painful, satisfying, and so forth.

Commenting on the kind of rationality we find here, Churchland (2002:228) concludes that "The neural evaluation and assessment of options probably resembles less the clean, step by step execution of an algorithm than it does the rough and tumble jostling among puppies for access to the food supply. The process whereby neural networks settle into the next decision probably involves a kind of competition, and the winning option moves ahead for assignment of detailed movements. To put it crudely in the familiar framework of folk-psychology, a desire for immediate gratification can be outweighed by the fear of missing out on a more valuable good in the long run."

On the occasion when a weighty decision involves conscious deliberations, we are sometimes aware of the inner struggles, describing ourselves as having conflicting, ambivalent feelings. She admits that though introspection gives us some sense of the hurly burly subserving choice, we have little conscious access to its neural nature.

According to Churchland, in momentous decisions the competition alluded to is never a one-dimensional struggle between reason and emotion, but rather a complex interplay between this cognitive-emotive consortium and that cognitive-emotive consortium.

Coming to the connection between decisions and habits, Churchland *(2002:230)* explains that "A substantial part of learning is to cope with the world, defer gratification, show anger or compassion appropriately and have courage when necessary, which involves acquiring appropriate decision making habits. In the metaphor of dynamical systems, this is interpreted as contouring the terrain of the neural state space so that behaviourally appropriate trajectories are "well grooved" or "strongly attractive."

And further on *(2002:232)*: "As we deliberate about a choice we are guided by our reflection on past deeds, our recollection of pertinent stories, and our imagining the sequence of effects that would be brought out by choosing one option or another. Recognition of a present situation as relevantly like a certain past one has, of course, a cognitive dimension, but it also evokes feelings that are similar to those evoked by the past case, and this is important in aiding the cortical network to relax into a solution concerning what to do next. This is the platform for one's neuroscience." [9]

2.4 COMPUTERISM

2.4.1 *Artificial intelligence*

Artificial intelligence (AI) may be regarded as the idea that computing machines perform tasks that would usually demand human intelligence and judgement. To a certain degree computers have been constructed that do tasks like guiding missiles, flying machines on autopilot, proving theorems, predicting weather and so on. A computer is just a machine that receives, interprets, stores, manipulates and uses information to supply answers to problems. This activity seems comparable to the function the brain performs and it is no wonder that in certain circles (especially amongst functionalists) the brain is compared to and considered a computer. It obviously lacks however conative function (motivation, drive etc.) and affective function (emotions etc.).

Instead of asking the question of whether a machine can think, Turing replies that a better question would be whether a sophisticated computer could ever pass a battery of (verbal) behavioural tests, to the extent of fooling a limited observer into thinking it is human and sentient; if a machine did pass such tests, then the putative further question of whether

the machine really thought would be idle at best, whatever metaphysical analysis one might attach to it.

Lycan *(1999:6)* comments that "Putnam compared mental states to the functional or logical states of a computer. Just as a computer program can be realised or instantiated by any number of physically different hardware configurations, so a psychological "program" can be realised by different organisms of various physiochemical composition, and that is why different physiological states of organisms of different species can realise one and the same mental statement type."

According to Lycan *(1999:6)* Putnam's "machine functionalism" mobilises three distinct levels of description but applies them all to the same fundamental reality :

"a) Physical state-token in someone's brain at a particular time has a neuro-physiological description.

a) It may also have a functional description relative to a machine program that the brain happens to be realising.

b) It may have a mental description if some mental state is correctly type-identified with the functional category it exemplifies."

This approach makes use of the "different languages" model and to me it seems to be useful for my own purposes in the present context.

The fact that many people see human intelligence and cognition generally as matters of computational processing raises two questions: How do computers compare to minds, and how do minds compare to computers? Lycan *(1999:7)* divides the first question into four sub-questions:

"(i) Will any computer ever be able to perform intelligent tasks? (This is a question of engineering)

(ii) When a computer performs a certain task, does it do so in the same way a human does? (This is a question of cognitive psychology)

(iii) Should the answer to (ii) be yes, does this then show that a computer has psychological and mental properties such as (real) intelligence, thought, consciousness, sensation, feeling emotion, etc? (This is a question of philosophy)

(iv) Can a computer totally spontaneously "think" of anything?"

As far as the second question is concerned, supporters of AI are of opinion that computers can simulate and thus serve as models of human cognition and that they are therefore an invaluable tool in research on cognition and the mind-body problem. One must however not forget that the mind interprets and knows the meaning of symbols, and the computer just produces them not knowing what they mean. Lycan *(1999:8)* concludes: "A major question is whether regardless of computer construction, human mental capacities and entities can be entirely captured by a third person. And: could this be captured by a hardware design of some sort that can be built in a laboratory? The answer one will give to this question will depend on ideological commitment such as behaviourism, functionalism, etc."

According to Churchland and Sejnowski *(1999:138)* many make the assumption that cognition essentially involves representations and computations and that representations are in general, symbolic structures, and computations are, in general, rules (such as rules of logic) for manipulating those symbolic structures. They thus make the assumption that a good model for understanding mind-brain functions is the computer — that is a machine based on the same logical foundations as a Turing machine and on the von Neumann architecture for a digital computer. The result is that the mind-brain, at the information processing level, is understood as a kind of digital computer, and that the problem for cognitive psychology is to determine the program that our brains run. The idea here

is that cognition is based on language and logical reasoning; having a thought or a sentence in the head is seen as doing logic or running on procedures very like logic. Furthermore a sentence has content and stands in specific logical and semantic relation to other sentences. Finally it is accepted that cognitive states have meaning (content or intentionality).

Coming back to Churchland one is immediately struck by her hostility towards the basic framework within which the above interpretations were developed. Remarkably she links this framework itself to "folk-psychology". Churchland *(1999:8)* expresses the opinion that these concepts are "well and truly rooted in folk-psychology"

2.4.2 *Sententialism*

Churchland and Sejnowsky *(1999:138)* caution their readers: "Extending this framework of folk-psychology to get an encompassing account of cognition in general, this approach takes it that thinking, problem solving, language use, perception, and so forth will be understood as we determine the sequence of sentences corresponding to the steps in a given information-processing task; that is as we understand the mechanics of sentence crunching." This research program is known as "sententialism". It appears as if the "sentence model" against which Churchland warns, acts as a kind of part-whole modelling of a paradigm/ideology that is itself larger than "sententialism" in a strict sense.

Although this view, sententialism, according to Churchland is appealing, it suffers from major defects and she summarises them as follows:

1) Machine computation is much slower than the workings of the mind/brain.
2) Neural architecture is highly interconnected.

3) Information storage in the brain appears to be radically different from storage in a computer.
4) Things we humans do effortlessly, like face recognition, are tasks that AI constructers have great difficulty simulating on a von Neuman machine.
5) The hardware/software analogy fails, since the nervous systems are plastic and neurons continually change as we grow and learn.
6) How many levels of organisation we need to postulate in order to understand nervous-system function is an empirical question, whilst a computer operates on two: hardware/software.
7) How is cognition accomplished by infra-verbal humans and nonverbal animals?

Churchland thus rejects the sentence-logical model of cognition. Other questions she raises in this regard are *(1999:139)*: "How does the brain represent? How does the nervous system model the external and the internal worlds? If representations stand in semantic and logical relation to one another, how do neural networks achieve this? How is the semantic and logical structure of language - as we both comprehend and speak - represented in the brain? Although rejecting the sentential model we may still postulate an internal organization - a language of thought with the very same structure and organization as language. When this latter model is rejected with what do we replace it?"

Churchland accepts that there are neuronal processes underlying cognition and that these processes have a structure of some kind, but she does not believe that these processes will look like the semantic/logic structure of overt language. By framing hypotheses and doing experiments just as in embryology and genetics, where there is a structural organisation that enables development but in no way resembles the final product, we will hopefully come closer to answers. In the end Churchland *(1999:140)*

concludes that "Instead of starting from the old sentence-logic model, we model information processing in terms of *the trajectory of a complex non-linear dynamical system in a very high-dimensional space.* This structure does not resemble sentences arrayed in logical sequences, but is potentially rich enough and complex enough to yield behaviour capable of supporting semantic and logical relationships."

2.4.3 *Connectionism and digital computers*

A particular kind of non-linear dynamical system is called a connectionist model. Churchland *(1999:140)* describes this as follows (see also my own previous remarks in 1.5 above): "A connectionist model is characterised by connections and differential strengths of connections between processing units. Processing units are meant to be rather like neurons, and communicate with one another by signals (such as firing rates) that are numerical rather than symbolic. Connectionist models are designed to perform a task by specifying the architecture, the number of units, their arrangement in layers and columns, the patterns of connectivity, and the weight and strength of each connection"

Churchland *(1999:141)* believes that "these network models should be considered a class of algorithms specified at various levels of organization. Although these networks have to be built by available materials, they have to be powerful enough to match human performance of the computational tasks, which in the case of the brain means neurons and synapses, and in the case of the computer, neuron-like processing units and synapse-like weights."

Churchland *(1999:141)* emphasises that the connectionist models cannot yet support a full cognitive system, as the networks that have been constructed can at the most only be considered a small part of a complex system and cannot be seen as a simulation of a whole system. Only recently has

sufficient computer power been developed to allow the construction of parallel network models to explore many different aspects of perception and cognition: advances in this field are promising. Two examples of what has developed are NETALK that learns to convert English text to speech sounds, and a network model that computes surface curvatures of an object from its grey level input image. Churchland *(1992:142)* states: "In the models reviewed here the processing units sum the inputs from connections with other processing units, each input weighted by the strength of the connection. The output of each processing unit is real number that is a non-linear function of the linearly summed inputs. The output is small when the inputs are below threshold, and it increases rapidly as the total becomes more positive. Roughly, the activity level can be considered the sum of the post-synaptic potentials in a neuron, and the output can be considered its firing rate."

She furthermore points out that it is important to note that the network processes information by non-linear dynamics, not by manipulating symbols and accessing rules, and that the network is able to learn by gradient descent in a complex inter-active system, and not by generating new rules.

Finally again contrasting digital computers with brains, Churchland *(2002:284-5)* notes also the following problems:

a) Computers have a memory module independent of the structures that process information, but nervous systems do not. Brains do have areas of functional specialisation, especially at maturity, but the specialisation exists with a degree of functional mobility that is not at all compatible with the idea of "encapsulated dedicated modules".
b) Neurons, unlike computer chips, grow and develop (at least in the hippocampus new neurons are generated into adulthood), or prune back

and die. Neurons are dynamical entities, and they change structurally as they learn, making new contacts, abandoning old ones etc.

c) Nervous systems have a parallel organisation; computers are serial machines. Neuronal events happen in the millisecond range; events in the present day computers may be four or five orders of magnitude faster.

d) Computers have a clock that sets *now* for all components; as far as we know the brain has not.

e) Computers were designed by humans to crunch numbers; nervous systems evolved through natural selection to move bodies adaptively. The former is non-semantic or "clean" computation; the latter is life oriented, "dirty" computation.

It has been observed that for those things we humans find quite difficult, such as playing chess or theorem proving, conventional AI approaches have been quite successful, whereas for those things we find easy, such as perceptual recognition and speech comprehension, the success of the conventional approach has been negligible. Churchland *(1998:458)* concludes that "One line of reasoning is that the conventional simulations will never be any good, however many bells and whistles are added, because they depend on assumptions that are at odds with the biology of nervous systems, and a nervous system is still the most impressive example we have of an information processing device."

Notes

[1] Note the importance Churchland herself ascribes to metaphors. But in discursive deep structure analyses, the idea reaches even further. Metaphors are sometimes more deeply hidden in a text than is the case in this example. Furthermore, such metaphors may not only cast light upon the basic conceptual formula that a thinker tends to use; they can also highlight hidden tensions within such formulas.

[2] A question to ask dealing with psychology is whether psychology studies consciousness as such, or rather the psychological aspect of consciousness.

[3] In terms of my interest in the metaphorical level of the discourse, I note here how consciousness is approached via a mechanistic metaphor, which again links up with the concept of causality.

[4] In my own view what needs consideration here is the fact that it is not my neural activity that is aware – it is I who am aware, amongst other things, by means of neural activity.

[5] Notice that Churchland's formulation here very much appeals to the self as a unitary construct.

[6] The meta-representational capacities serving consciousness must involve self-attribution, {this pain is mine}, self-representation {having a point of view}, self- control {I will want to eat}, and the relations between inner and outer things. Those organisms that have this ability have a better chance of survival and reproduction. It is thus a determining component in evolutionary advance and survival.

At this point I would like to raise the question of whether every capacity of mind, such as language and number ability for example, can be explained in terms of survival plus? The answer to me seems negative. (It is well-known that Chomsky, for example, also doubts a strict evolutionary origin of language in this sense. *(Churchland, 2000:65)*

[7] One of the analytical tools I will develop in the next chapter indeed shows critically how theorists, in their key formulation, often tend to choose selectively between unity and multiplicity, constancy – dynamics, necessity – contingency, etc.

[8] This approach of Churchland also fits in with the ideas of Dennett and Baars that there is no central Cartesian theatre and that the self is widely distributed across the brain.

[9] I note in passing that Churchland in the present context, apparently refrains from talking of "the cortex's decision". This does not seem totally in keeping with linguistic usage I have referred to earlier (where agency is dissolved into material structures).

Chapter 3

DISCOURSE, DEEP STRUCTURE IN THE WRITINGS OF CHURCHLAND

3.1 *Background remarks*

In attempting to undertake a critical analysis of Churchland's view of the mind-body problem, it is appropriate to pay some attention to the entity of "mind". The "mind" proves very hard to define and even harder to observe. There is no doubt however that we do become aware of what the results are of the activity of our mind and the minds of others. The fact is that at this stage we do not understand adequately how the mind functions and how it is that we become aware of the results. Though some "mysteries" of the mind have lately been up-graded to "problems" (to use Chomskian terminology), others have remained mysteries, for example the question about the roots of creative action. In spite of claims by some that neuroscience is changing the mystery of the mind to a neuroscientific problem, many, including myself, are at this stage not convinced that we are any closer to solving the workings of the mind. (In contrast we are discovering more and more about the workings of the central nervous system.) The major problem in my view is to prove that the brain somehow has the capacity to produce conscious awareness.

"Mind" like other terms in philosophy, is not a technical term - it is bound to have more than one meaning. However before we construct a theory about the mind, we need to disambiguate the term - to some degree - so that we have a clearer idea of what we are about. For example there are properties of the mind, there are the faculties of the mind, and then there is the phenomenon of the mind. The latter is in itself perfectly natural and in no way mysterious. It seems that different sorts of technical terms are

introduced by philosophers and others to capture the more technical, and also the more specific, characteristics of "mind". We must keep *in mind* that having a mind is like possessing a faculty and that some of our mental states like emotions, belief etc. can become conscious, whilst some remain unconscious. We should also accept that the mind has different capacities, (on some level these may also be referred to as faculties) but that they are however limited. In fact such limitation is necessary for a capacity or a faculty to function at all. To all this must be added the fact that mind is also the property of a specific person in space and time in certain discussions.

In this study we have reached the point where the question arises as to whether Churchland gives enough consideration to the mind in its different facets. Does she always take the different properties of the mind in consideration? My contention is that concentrating on the neuroscience aspect of the workings of the brain and equating the brain to the mind, some of these facets - in their uniqueness - are lost to her.

It is the faculty of the mind that makes the human unusual in the animal kingdom and not our body (in the sense that most people use the latter term). The mind, through its mental programme, gives rise to behaviour that makes the basic difference. In the end the organised complexity of mind is often the result of evolution and often it is in the service of survival and reproduction. Steven Pinker *(1997:21)* puts it this way: "The mind is a system of organs of computation designed by natural selection to solve the problems faced by our evolutionary ancestors in their foraging way of life, in particular understanding and outmanoeuvring objects, animals, plants, and other people." There are differences in the minds of people, but they differ because they pool bodies of expertise fashioned in different times and places. These can be considered minor differences on the whole and these differences are not of crucial importance when we ask how the mind

works. What we want to research and theorise is the universal structure of the mind.

The major faculties of the mind are perception, reasoning, emotion, intelligence, interacting in social relations, and reacting, motor or otherwise to the above. Again we cannot peer inside our faculties to see what makes them function. I would agree that the mind must be equipped with a small stock of basic knowledge repertoires and a set of rules to deduce the implications of our perceptions, concepts and thoughts. This can account for the efficiency of the mind in the face of the poverty of stimuli that act upon it. Many cognitive scientists believe that the mind is equipped with innate intuitive theories or modules for the major ways of making sense of the world. The mind therefore has limitations but also mechanisms to overcome most of them. It is this theme of innate abilities that in my opinion, does not receive the attention it merits from Patricia Churchland.

Let me list, in a summary way, the various levels of analysis that seem to me relevant for discussing the nature and function of mind:

Biological activity
Evolutionary background
Innate knowledge
Cultural background
Belief background (morality, ethics, beliefs, etc.)
Environmental background
Educational background (acquired knowledge and expertise)
Socio-economic background
Biographical background

There is no doubt that the mind is closely associated with brain activity, and that this activity is limited to various modules of mental activity, each

with a specialised field of activity but continuously interacting with other modules. Modules are best described by the things they do, not by their anatomical construction. The modules or aspects of the modules may be unpredictably different from one another but the different modules are organised to cause the system to achieve some special effect — there has to be a unity of function. Pinker *(1997:24)* says: "The mind is not the brain, but what the brain does. The brain's special status comes from a special thing the brain does, which makes us see, think, feel, choose and act. That special thing is information processing or computation." Precisely how this is brought about, how the physical activity of the brain gives rise to the non-physical to which we refer, remains a mystery. Some see the answer to this question in the computational theory of mind which is not the same thing as the despised "computer metaphor" in which others see the solution. Circuits of neurons do not do exactly the same things as circuits made of silicon, and vice versa. The computational theory of mind, even with complete neural underpinnings, offers no clear answer to sentience, subjective experience: that is raw feeling, first person present tense; what it is like to be or do or feel something.

Due to morality and ethics, mental life is often a struggle when there is desire. Mental life often feels like a parliament within. Thoughts and feelings vie for control as if each were an agent with strategies for taking over the whole person. Self-control is unmistakably the outcome of a tactical battle between parts of the mind even if these are only different thoughts "crossing" our minds.

Consciousness is an essential part of the mind. When not conscious, we experience nothing and only on regaining consciousness can we have mental activity of which we become aware. When conscious we can have the following experiences:

a) Sensory experiences: i) a range of sensory perceptions.
   ii) somatic sensory perceptions.
b) Non-sensory experiences: Remembering, knowing, imaging, attending, wondering, surprise.
c) Emotional states: Fear, anger, sadness, elation.
d) Drive states: hunger, thirst, sexual desire, parental love.
e) Capacities that are dispositions and the exercise of those capacities.
f) Conscious awareness.

When we experience something we form a concept of what we are experiencing. This gives rise to the following questions:

a) Do we have *a priori* concepts – and if so can we ask where they are situated?
b) Do we always form a concept when we experience a perception?
c) How easily do we form a concept and how permanent is it?
d) We have moral and ethical concepts: these are continuously formed and altered – modulated. Where in our idea of mind does this fit? How much of this is evolutionary of origin, and how much is developed through religion, education, experience etc.?
e) What does a concept consist of? What role does language play in our concepts? Are concepts in our minds in syntactic or semantic form?

I find that Churchland does not address these questions or indeed approach them on the basis of neuroscience. The reason for this, I suspect, is that such explanation is not (currently) possible and might not ever be possible.

In all of her discussions it is always notable that they are in a sense depersonalised. Before even considering technical questions about reduction, she has already reduced the human being to the mind and the mind to neural activity. Yet the fact remains that it is "I" who has a desire, it is "I" that walks, it is "I" that talks, it is "I" that thinks, etc. It is

meaningless to say that it is my brain, my mental state and my neuronal functions that do these things. In the Churchland approach it is precisely the human element that is thus completely lost: the system of convictions, ideals and beliefs that make us human.

I will now proceed to a more systematic account of the "key" conceptualisation that I believe is at work in all Churchland's writings. To this end I will employ the theory of logosemantics as proposed by Visagie *(2003)* in his unpublished manuscript *The Games Philosophers play.*. This theory has been influenced by the work of Dooyeweerd, a twentieth century Dutch philosopher, who in his own philosophical analyses argued the existence of a so-called "ground idea" as the basis of all philosophical thought. Visagie, with "key formulas", confined the latter to discourse semantics, in contrast with Dooyeweerd, who with the use of ground ideas, did not. To a certain extent Visagie's logosemantics is also indebted to Derrida's standpoint that every discursive system necessarily posits a centre (a kernel), the point from where everything comes and to which everything refers, whilst such systems or structures tend to consist of binary oppositors - terms or concepts existing in hierarchical reaction generated from the stable "ground" or placed in some sort of relation as is well-known. Derrida advocated the critical "deconstruction" of such supposed foundations.

Logosemantic analysis is complemented by critical attention to the figurative aspects of a discourse, especially the structure and function of metaphors. As previously indicated, I will thus also focus, not only on Churchland's key conceptualisation, but also on the way metaphors interact with her key conceptualisation.

Finally, both of the above structures of discourse are specified or contextual in a given ideological framework. In the case of Churchland, I take this to be the framework of eliminative materialism. These three interwoven

aspects of a theoretical discourse, I label the "discursive deep structure" of the latter analysis.

As already previously indicated, in the analysis and discourse, use will also be made of metaphor analyses. In this instance several very functional metaphors lend themselves to this type of analysis.

Lastly ideology theory as applicable in this case to *eliminative materialism*, opens the door for discourse and analyses regarding philosophical theory, religion and life in general.

3.2 *Logosemantic Analysis*

Visagie explains as follows *(1998:342)*: "Logosemantics is a theory about philosophical discourse. Not only the discourse belonging to the individual subject: philosophy, but also the discourses of other disciplines, as far as these contain pronouncements of a philosophical nature. The basic premise of logosemantics is that, just as we may study the syntactic structures of everyday language, so we may study the conceptual (logosemantic) structures of philosophical discourse.".

In opposition to Derrida's logosemantic goal of deconstructing all conceptual hierarchies, logosemantic theory maintains that the latter are an unavoidable structuring component within all philosophical and theoretical discourse. It can be shown, for example, that Derrida's own discourse is by no means free from such key formulas. (I do not wish to address this issue here and refer those interested to Visagie's writings.)

The idea is thus that when "speaking philosophy" we revert to combining certain kinds of concepts in a certain way. It is this combination that takes the form of the logosemantic propositions or philosophical "key-formulas". These formulas form part of what Visagie would refer to as the "*deep*

structure of philosophical discourse." The other parts are figurative structures and idea frameworks. Logosemantic propositions or *"key-formulas"* can be thought of as kernel propositions that ground and sustain the body of any philosophical discourse. These kernel propositions can usually be identified and reconstructed from actual expressions in the discourse involved. In a philosophic - theoretical discourse the kernel proposition is linguistically expressed in the simple subject-verb-object form. But in the technical terms of logosemantics this triadic form is denoted as:

SUBJECT ? OPERATOR ? DOMAIN

The *subject category* of the kernel proposition, where the subject is the important thing that in some way structures or influences a part or the whole of reality, involves that particular function, entity, process or part of reality that is indicated in an explanatory relation to the rest of reality. There is also the possibility that only a sector of reality, for example knowledge, is the dependent domain in the kernel proposition e.g. Foucault's POWER ? KNOWLEDGE formula.

The *category of the domain* is usually also expressed in noun form and denotes those parts of reality that are in some way dependent on the indicated subject. (Such as, knowledge is dependent on power in the above formula.)

The *operator category* functions in the verb form, indicating the precise action performed by the subject on the domain. A relation of dominance of the subject over the domain is at work here. The operator can take on several forms such as determine, rule, cause, contain, ground, structure, transcend, unify, etc. All these possibilities have in common that they depict in one sense or another how the subject may dominate the domain.

Both the subject and the domain of the kernel proposition may have accompanying "adjectives". This then gives rise to another category: that of attributes. In philosophical conceptualisation an entity or concept in the role of subject or domain can be either, one or many, finite or infinite, constant or changing, knowable or unknowable, universal or individual, etc. Visagie *(1998:344)* with a view to the figurative component of discursive deep structure states that "Together with these attributes, the specific kernel proposition can also be accompanied with complementary figures and metaphors - this allows for a more comprehensive and thorough discourse analysis".

In the introduction to *Brainwise,* Churchland *(2002:1)* states that "Bit by experimental bit, neuroscience is morphing our conception of what we are". Here I would like to focus on what I will list below as the first key formula in Churchland's discourse:

(1) NEUROSCIENCE ? FORMS ? SELF.

What this formula expresses – and we find this often in philosophical discourse – is that a certain kind of knowledge will form an adequate concept of the self (through transforming our present concept). The above quote continues: "The weight of evidence now implies that it is the *brain*, rather than some non-physical stuff, that feels, thinks, and decides" (*Churchland, 2002:1)* thus we see that right from the start of the introduction of her book Churchland reveals a fixed direction in her theoretical thought, which is directed at proving that the mind is nothing but neurological activity.

What is important to see in the key formula (1) above, is first of all that Churchland looks to a very grand domain, namely the human self, to

illustrate as it were, the theoretical power of her formula subject (the latter being capable of transforming our basic picture of the self). Secondly we see the subject in question disclosed as theoretical knowledge, which is, thirdly, delimited to neuroscience. The important critical question to raise here is whether something so basic as our understanding of the self can orshould be delivered totally into the hands of science – and then a very limited, very specific science at that.

Churchland *(2002:1)* expands on the above statements as follows "One's decisions and plans, one's self-restraint and self-indulgences, as well as one's unique individual character traits, moods, and temperaments, are all features of the brain's general causal organization. The self-control one thinks one has, is anchored by neural pathways and neurochemicals." The mind that we are assured can dominate over matter is in fact certain brain patterns interacting with and interpreted by other brain patterns.

In these sentences we see the logic of formula (1) at work. It is interpreted, expanded, advocated. Nevertheless, though Churchland avails herself of vigorous argumentative logic, it is important to see that the underlying formula itself, is more a matter of belief than logic.

Neuroscience, in the opinion of Churchland, will in the long run solve the mind-body problem and will also eliminate several "folk-psychology" understandings of, for example, consciousness. When she sees neurological activity as the total explanation of mind then she has to explain the mind totally on this basis. The implication of her formula is that there is no non-physical mind and that "mind" must be explained on the basis of physical activity. She employs the notion of neural activity as the key factor of mental activity and of the mind. Here we see the necessity for adducing a second formula, however closely linked to the first.

(2) NEURAL ACTIVITY ? CAUSES ? THE MENTAL

Here we see the object of the knowledge in (1) depicted. Neuroscience is a golden key, but what it unlocks is the hard reality of neural activity. The problem of how neurological activity can give rise to the non-physical mind (thought, reason, decision-making, etc.) remains unanswered. But such is the force of key formulas that they can override just about all questions placed in their way.

Falling in love and passion Churchland *(2002:1)* acknowledges as real but explains further that "We understand those important feelings to be events happening in the physical brain". Formula (2) is one that leads to a biological determinism (just as in the case of Dennett). Specifically, higher "capacities of the mind" are to be reduced to this determinant, which can be specified as neuronal states and processes. This is understood as a kind of physicalism that emerges at the level of biology. [1] She expects the whole notion of "conceptual framework" also to be reducible, ultimately, to cognitive neurobiology.

To overcome the problem of our experiencing something (in the end it is the person who experiences something and not the brain) she states *(2002:1)*: "Stranger yet, it means that the introspective *inside* - one's own subjectivity - is *itself* a brain-dependent way of making sense of neural events. In addition, it means that the brain's *knowledge* that this is so is likewise brain-based business." What Churchland is attempting to do here, is to counter a key formula describing common human experience, namely:

(3) SELF ? CENTERS ? EXPERIENCE

Churchland's discourse in effect replaces (3) with a formula deriving from (1) and (2) namely:

(4) NEURAL ACTIVITY ? FORMS ? SELF

Of course we cannot but believe that neural structures are involved in our experience of a centralised self, at the root of (notice the two different values for the same operator here) our actions and experiences. So what has to be explained is the part that neural activity plays in constructing this experience of a self – and not to try and explain it away:

(5) BRAIN KNOWLEDGE ? BRAIN BASED BUSINESS

Notice, however, how Churchland's analysis in fact seems to be saying two things: that the self is a neural event making sense of neural events, and that the knowledge that this is so, is also a neural event. Analysing the key formulas here, they seem to be circular: seeming to say neural events depend on neural events:

(6)

? NEURAL ACTIVITY FORMS SELF

- SELF ORGANISES NEURAL EVENTS
- NEURAL ACTIVITY GENERATES BIOLOGICAL KNOWLEDGE

In (6) above we can in fact analyse the seeming circularity as: a------b

b------c structure

c------d

Formally this is the same type of logosemantic structure that we would for example find in the belief that: Man ? Culture

Culture ? Religion

Considering the fact that the mind is influenced by background emotions, knowledge, experience, culture, beliefs, as well as a host of other factors, it is difficult to see where, in Patricia Churchland's paradigm, these come

from, where they are situated and through what neurobiological activity they are brought into play.

There is a way in which key formulas function in science and the humanities, which seems to offer an alternative to their extreme reductive implementation as we have been witnessing in Churchland's discourse. Consider (4) and (5) above: Here we see again claims being made about operator power (here the power of enclosing) in relation to huge fields of differing phenomena. On the one hand, the discipline of linguistics is held to wield that power, and on the other hand the discipline or field of ethics.

Regarding the first example it is relevant in the present context to point out that though someone like Chomsky postulates significant links between linguistics and the science of the brain, what we actually have today, in terms of the analysis of lingual phenomena, is recognisably of a linguistic and not biological nature. (consider for example the structure of syntactic analysis.) The same holds *mutatis mutandis* for ethics and biology.

Thus, though logosemantic analysis can and should make ample room for causal relations between the biological and both the lingual and the ethical, everything depends on the way such relations are interpreted. Presently the facts do not warrant us to deconstruct the "operational power" of ethics or linguistics in such a way as to "sign over" this power to brain sciences.

In general we have the following key formulas to overcome the problem – although not considered by Churchland.

(7) LINGUISTICS ? ENCLOSES ? LINGUAL PHENOMENA

(8) ETHICS? ENCLOSES ? NORMATIVE BEHAVIOUR PATTERNS

Given the preceding analysis, an acceptable formula for current research in the cognitive and neuro-sciences would be :

(9) NEURAL ACTIVITY ? IS FOUNDATIONAL TO/GROUNDS ? THOUGHT, EMOTION LANGUAGE, BELIEFS, ETHICS, SOCIETY, CULTURE.

The above formula captures the foundational importance of the brain for the mind and for the actions and systems in which the mind participates, without invoking a problematic reductionism. Notice, that X being foundational to Y, does not infringe upon the uniqueness of Y (if this is indeed the case). Of course, all uniqueness is embedded in networks of coherence. The latter viewpoint could be said to be the foundation for critical logosemantics. Furthermore does this mean that Churchland's own theories are reduced to this technical language (that of biochemistry)? If so, how do they relate to the act of critically evaluating theories? How can biological processes, as such, be critically judged? [2]

Let me make another point in the present context. If biochemistry were thought to totally enclose or fill out mental states, would this mean that the state of believing something for example, can be described in biochemical language? This gives rise to the question of whether Churchland's own beliefs can thus be described.

As we see from the above formulas the problem is not with neuronal activity in the subject position. The solution is to have the latter formula firstly exert a specific kind of operator power, namely foundational power, and secondly to have this formula embedded in others that (also) rule out strong reductionism. Consider for example:

(10) MENTALITY ? CAUSES ? NEURAL EVENTS

Here we have depicted the possibility of an acquired mental state having "feedback" effects on neural activity (cf. remarkable experiments with mystics, in this regard).

Brain states have at least two types of properties, mental states and physical properties. Churchland is of the opinion that both are physical entities. There is however no doubt that at present mental states cannot be seen as physical. The chasm between physical actions in the brain, which can be observed with imaging technology, and awareness, which is non-physical, has not been bridged. We know that certain areas of the brain are involved in certain mental activities but how these physical "reactions" become non-physical "thoughts" is not explained by neural activity (biology).

By eliminating the mind and replacing it by neurone activity, Churchland has thus attempted to negate the problem of our not being able to wipe out the concept of mind from our vocabulary. Although we accept that disturbance of neuronal activity (by factors like physical damage of neurones or networks, chemical disturbance of neuron activity and metabolic factors influencing neurons or networks) will affect the mind, we do not accept that Churchland's ideology can explain what I experience as the content of my mind.

In Churchland's approach the mystery of how spontaneous thoughts enter the mind also remains unanswered. Perhaps they are due to the continuous restless activity of the neurons, or can be explained by means of some quantum mechanism? Our experience often is that a thought will just occur "out of the blue". Do not forget that we decide on the specific thought and the direction in which our thought processes will advance.

The key formulas that seem at least to give recognition to this state of affairs are:

(11) BRAIN ? IS FOUNDATIONAL FOR ? MIND

(12) MIND ? TRANSCENDS ? BRAIN

Note that the above pair of formulas do not subscribe to a mind-brain dualism, nor are they contradictory. Also, (12) seems to be logically connected to (10).

Nearing the end of my logosemantic analysis, I would like at this stage to propose my belief that the neuro-sciences should, far from reductionism, take their departure from a holistic anthropology.

(13) HUMAN BODY ? ENCLOSES ? ASPECTS OF
PHYSICAL,
BIOLOGICAL,
PSYCHOLOICAL,
MENTAL, structures

The above formula (which distinguishes between the psychological in the sense of the sensitivity, feelings, etc. which higher primates can experience, and the mental in its uniquely human sense) provides a context for the neuro-sciences, for the brain itself, as an organ, to be enclosed by this body (again ruling out a mind-body dualism). Thus the point of departure for new philosophy should be:

(14) HUMAN BODY ? ENCLOSES ? DIFFERENT ASPECTS

DIFFERENT ASPECTS ? ENCLOSE ? THE BRAIN

The approach evidenced in (13) will locate neuro research in the necessary broad context, not subtracting from, but rather adding to the awe with which we may view this particular organ. This feeling of awe is something we fully share with Churchland.

3.3 *Metaphor Analysis*

Lakoff and Johnson *(1980:3)* state that "Metaphor is considered by most people as a extraordinary language with the essence of understanding and experiencing one kind of thing in terms of another; a matter of words rather than thought or action. Metaphor however plays a role in all aspects of our everyday life, also in our conceptual system, in terms of which we both think and act." In this way we find that:

a) Language is metaphorically structured.
b) Concepts are metaphorically structured.
c) Thought processes are metaphorically structured.
d) Activity is metaphorically structured.

Concepts structure what and how we perceive and understand, how we relate to the world and other people etc. Lakoff and Johnson *(1980:3)* continue "If we are right in suggesting that our conceptual system is largely metaphorical, then the way we think, what we experience, and what we do every day is very much a matter of metaphor." We are however not aware of our conceptual system and if we want to become aware of metaphor we have to look at language. Metaphors in language are there because our concepts are metaphorically structured. Metaphorical concepts are systematically structured and therefore our language is systematically structured. Lakoff and Johnson *(1980:7)* explain that "Since metaphorical expressions in our language are tied to metaphorical concepts in a systematic way, we can use metaphorical linguistic expression to study the

nature of metaphorical concepts and to gain an understanding of the metaphorical nature of our activities."

The fact that abstract thought is mostly metaphorical means that answers to philosophical questions have always been, and always will be, mostly metaphorical.

Aspects of concepts are understood in terms of other aspects of the same concept and this will highlight some and suppress other aspects. This invites us to celebrate data that fit, and ignore those data that do not and are just awkward. As invaluable as metaphors are they can seduce us into believing we understand more than we really do. Lakoff and Johnson *(1980:10)* mention that "A subtle way of how a metaphorical concept can hide an aspect can be seen in the so called "conduit metaphor" where

- ideas (or meanings) are objects,
- linguistic expressions are containers, and
- communication is sending.

The speaker puts ideas (objects) in words (containers) and sends them (along a conduit) to a hearer who takes the idea/object out of the word/container." Two imaginary examples of the conduit metaphor in the case of a reading of Churchland's discourse would be:

a) Churchland tries to get the idea across that ……
b) In these statements we find no evidence that…..

Usually people tend to assume that words and sentences have meaning in themselves, independent of any context or speaker. The meanings are objects and have existence independent of people and context. The conduit metaphor highlights this understanding of communication: the objects that

"go in" and "come out" are the same. But here we see an example of metaphor hiding an essential part of meaning, namely contextual dependence. Where context differences do not matter and where all the participants in the conversation understand the sentences in the same way the role of the metaphor does not matter, but there are many instances where the context does matter. Thus there are sentences that have different meanings to different people. It matters a great deal who is speaking and who is listening and what the circumstances of sender and receiver are.

. In general the interpretation of metaphors may be influenced by personal values and subculture, but there are also more universal aspects of human experience that play a decisive role here. Lakoff and Johnson *(1980:19)* comment that "In actuality we feel that no metaphor can ever be comprehended or even adequately represented independent of its experiential basis." Our experiences with physical objects, for example, provide the basis for viewing events, activities, emotions, ideas, etc. as entities and substances. For us they become similar to viewing them as something physical and this is often demonstrated in the metaphors we use.

As to the metaphorical complement of Churchland's key formula featuring biological determinism, she contends that it is a fact that certain operations of the brain are not consciously accessible. She writes *(2002:48)*: "There is overwhelming evidence that non-conscious *cognition* plays a critical role in memory retrieval, belief consolidation, judgement, reasoning, perception and language use." She states that these operations are comparable with the operation of a computer, and behind the computer metaphor, we can detect a general machine metaphor that attaches itself to the subject of her key formula. I will represent this state of affairs in (15) below (recall Churchland's ideal of thinking about consciousness in terms of mechanisms:

(15) [COMPUTER (COMPUTATIONAL)].

/

[MACHINE]

Several comments are in order here. The first is that we have previously seen that Churchland rejects the approach of (15)

(16) NEURONAL

/

[LANGUAGE SEMANTIC-LOGICAL STRUCTURE]

The second is that we have also seen that she rejects an overly straightforward interpretation of (16)

(17) NEURONAL

/

[COMPUTER]

What Churchland is attracted to as we have seen in the discussion of connectionism is the following:

(18) NEURONAL

/

[COMPLEX SYSTEMS/INTERCONNECTED PARTS OF WHOLE]

Interestingly enough, Patricia Churchland's scepticism about the role of the computer metaphor as in (17) above is directly linked to the power of her keyformula subject. It is this metaphor's inherent suggestion that software can be distinguished from hardware (and mind from neurobiology) that she feels threatens the sovereignty of a totally neurobiological explanation.

At this stage of my analysis I must point out what is to me a crucial issue in this context. This is the critical question of whether the metaphorical conceptualisation evidenced in (18) and (17) is implemented (by Churchland) in such a way as to leave scope for the uniquely biological structure of the brain, even apart from the sensory or mental aspects, to come to the fore. It seems clear to me that the biological in itself is not mechanistical or syntactical or computerised or abstractly (numerically) systems-theoretical. The answer our analysis seems to suggest is a negative one. Eliasmith *(2003:493)* remarks that like symbolism and dynamicism, connectionism depends on the metaphor, in using it for explanatory purposes, and also for developing conceptual foundations in understanding the target of the metaphor. [3] In the terminology of Lakoff and Johnson, Churchland's models and metaphors of the brain are in the business of hiding the most fundamental biological characteristics of certain aspects.

Let me now move on to another metaphorical construct. From the perspective of metaphor analysis, Churchland's critique of folk-psychology rests on the following construct:

(19) EVERYDAY EXPERIENCE

/

[THEORY]

It is precisely Churchland's metaphorical construction of *everyday experience as a kind of theory* (a metaphor that is not sufficiently recognised as a metaphor) that leads to the familiar theoreticism we so often see scientists and philosophers fall prey to. The metaphor leads them, in the end, to fundamentally misconstrue the true nature of pre-scientific knowledge. Our pre-scientific experience of the everyday world is not a theory which has been proved wrong by better theories. The very nature of theoretical analysis is alien to our everyday involvement with the world. [3]

According to Lakoff and Johnson *(1999:260)* "There are three attitudes that one can take toward the conceptualisation of the mind as a computer as stated in the "Mind as Computer" metaphor. First, one can, as we are doing, note it is a metaphor and study it in detail. Second, one can recognise its metaphorical nature and take it very seriously as a scientific model for the mind. Many practitioners of what has been called the weak version of AI take this position. A third position has been called "strong AI." When the "Mind as Computer" metaphor is believed as a deep scientific truth, the true believers interpret the ontology and the inferential patterns that the metaphor imposes on the mind as defining the essence of the mind itself." It is my opinion that Patricia Churchland takes the second attitude.

Consider. Eliasmith's *(2003:493)* statement "However, when providing psychological descriptions, it is the metaphor that matters, not the identity. In deference to the metaphor, the founders of this approach call it 'brain style' processing, and claim to be discussing "abstract networks". This is not surprising since the computational and representational properties of the nodes in connectionist networks bear little resemblance to neurons in real biological neural networks."

Eliasmith elaborates as follows *(2003:494)*: "We are in a position, I think, to understand the mind for what it is: The result of the dynamics of a complex, physical, information processing system, namely the brain." He also advocates that we should move beyond the metaphors in use at the present moment because such analogical thinking constrains available hypotheses. The metaphors used by Churchland have insight to offer regarding certain phenomena displayed by cognitive systems but are unlikely to lead us to all of the right answers. She strongly supports the idea that development of neuroscience will provide these answers although at

present, in spite of tremendous development in neuroscience, we are no closer to answering these questions. Churchland, like other connectionists, has not escaped the "mind as a computer" metaphor completely: speaking of representations, considering the mind as a mirror of nature, and regarding some brain activities as comparable to computer activities.

3.4 *Ideology Analyses*

3.4.1 *The broader context*

Ideology in the critical sense is generally accepted as a term in the Marxist tradition to indicate how societies are structured so that the group holding or obtaining power can have the maximum control with the minimum of conflict. It is not a matter of groups planning to take power or to oppress people or to alter their consciousness, but rather a matter of using and manipulating institutions in society to alter values, concepts and symbol systems in order to promote a standpoint or ideal. It works through widespread teaching of ideas of how the world really works and how it should work. To achieve this, use is made of institutions like schools, churches, the media, literature, music, advertising, sitcoms, and so forth. The concept of ideology is generally associated with power relations but this, and the idea that it is confined to the political sphere, is too simplistic.

In the ideology-critical component of discursive deep structure, the concept of ideology is not confined to the political arena. In ideology theory distinction is made between three spheres in which ideology appears:

a) The sphere of social and cultural ideologies.
b) The sphere of philosophical ideologies.
c) The sphere of theoretical ideologies (science, and other theoretical disciplines and philosophy).

Examples of philosophical ideologies are: Platonism, Existensialism, Positivism, Structuralism and Postmodernism. I will limit myself to the particular sphere of philosophical ideology, as the other spheres are not pertinent to my analysis in the present context. In the discursive deep structure model theories and ideologies (to limit myself to one term in dealing with this particular sphere) are conceptually related to logosemantic formulas. The assumption is that we can see many ideologies emerge over the course of time, but that such ideologies are based on a common type of conceptualisation, namely the kind of key formulas we have explored in the previous subsections.

We need to distinguish more or less "typical philosophical" ideologies from the often more obscure paradigm clashes within specialised fields: think for example of holism or vitalism in biology, behaviourism or humanism in psychology, systems-theoretical or hermeneutic approaches in sociology, and so on. In the discursive deep structure approach, these differences are all understood to be ideological in character. They too, boil down to distinctive conceptual formulas. Moreover, they are often directly influenced by the "larger" main stream philosophies (such as those listed above).

The critical stance of ideology analysis allows the analyst to presume (until proven otherwise) that the formulas are foundational metaphors that structure a particular ideology, cause it to present a one-sided, selective, distorting view of the "facts" it seeks to explain. [5]

On the other hand, for a scientist, his or her ideological framework would:

appear to be the logical conclusion to scientific development;
appear to be natural — according to the order of things; and
appear to disclose the ideological distortions of other viewpoints.

Questions to be asked in ideological analyses are:

a) What are the assumptions made about what is natural?
b) What do these assumptions distort or obscure?
c) What problematic aspects are excluded, repressed or devalued?
d) How does the style of presentation contribute to the meaning of the text?
e) What kernel proposition lies at the heart of the ideology?

In connection with point e) it needs to be pointed out that an ideological framework, in its individuality, gives a specific kind of "colouring" to its kernel formula (and also the accompanying metaphors). For example, it is clear that a formula or sub-formula such as NATURE ? ENCLOSES ? CULTURE, will receive different interpretations, in say Greek philosophy on the one hand, and systems philosophy or neo-marxism on the other hand.

We may tentatively assume that Churchland's own frame of reference, like all ideologies, will contain contradictions or tensions repressing certain aspects whilst accentuating others that seemingly support it.

The ideology that frames Churchland's discourse is eliminative materialism. I shall now take a closer look at this frame of reference, which does not present itself as a "mainstream" philosophical ideology, but rather as a "speciality" ideology, a possible approach in the field of philosophy of mind.

3.4.2 *Eliminative materialism.*

Descartes can perhaps be considered the first eliminativist as he eliminated all the conceptual baggage necessary to arrive at an indubitably philosophical foundation. He cannot be considered a materialist however. Materialists eliminate immaterial things like the soul, beliefs, desires, etc.

Hume can also be considered an eliminativist in terms of our ordinary notion of the self. [6] The term "eliminative materialism" was first introduced by Conman *(1968:15-35).* Here already, we see the eliminativist key formula being shaped by concern with a physical grounding that reduces to itself. The idea that our concept of mentality may not be derived from direct access to the inner workings of our own mind, but rather from a theoretical framework that we inherited from our culture, was introduced by Sellars *(1956:253-329).* He claimed that our concept of mind was theory-based and as such could be falsified. Feyerabend *(1963:295)* argued that any form of physicalism would entail that there could be no mental processes or states as understood by common sense. Like Feyerabend, Quine *(1960)* also endorsed the idea that mental notions ought simply to be abandoned in favour of a more accurate physiological account. He questions how radical an eliminativist form of materialism would actually be, implying that no significant difference existed between considering mental states as physiological states and eliminating mental state terms in favour of physical state terms. Quine *(1960:265)*: "Some may therefore find comfort in reflecting that the distinction between an eliminative and an explicative physicalism is unreal."

Confusion now developed in early eliminativism. There were two different basic approaches:

a) There are no mental states, just brain states.
b) There really are mental states but they are just brain states (considered by some as simply reductive materialism).

The different key formulas at stake might be reconstructed respectively as follows:

(16) (TALK OF) NEURAL ACTIVITY ? ENDS ? (TALK OF) MENTAL STATES

(20) NEURONAL ACTIVITY ? CONSTITUTES ? MENTAL STATES

Churchland and her husband Paul are in the forefront of those supporting the first kind of eliminative materialism and their writings have forced philosophers and cognitive scientists to take eliminativism more seriously. They support the modern version of eliminative materialism that claims that our common-sense (folk-psychology) understanding of psychological states and processes, such as beliefs, desires etc. is deeply mistaken and that some or all of our ordinary notions of mental states will have no home, at any level of analysis, in a sophisticated and accurate account of the brain *(Churchland, 1999:45)*. In other words, it is their view that certain common-sense mental states such as beliefs and desires do not exist.

Eliminative materialists are of the opinion that folk-psychology is profoundly wrong about the actual nature of mind/brain as it radically mis-describes cognitive processes, and that consequently the posits of folk-psychology pick out nothing that is real. According to eliminative materialists including the Churchlands *(1999:43),* mental states as described by common-sense psychology, are irreducable not because they are non-physical; rather because they do not really exist. They believe that there is nothing more to the mind than what occurs in the brain.

In a certain sense eliminative materialism is self-refuting. The capacity or activity that is invoked by material elimination is itself something that requires the existence of belief. To assert something one must believe in it; thus for eliminative materialists to accept their thesis, they must firstly believe that it is true.

Another argument proposed is that beliefs and other mental states are used for many things besides explaining human behaviour, and explanatory theories about inner workings of the mind/brain do not seem to have much relevance for their actual status. This argument rests on the view that our talk about mental states should be interpreted as talk about abstract things that, although real, are not candidates for straightforward reduction or elimination as the result of cognitive science research. This argument rests on a perspective of Dennett *(1971:87-106)* that propositional attitudes are actually dispositional states that we use to adopt a certain heuristic stance toward rational agents.

Another argument raised against material eliminativists is the "simulation theory". According to the simulation theory, as described by Martin Davies *(1999:415),* we predict and explain behaviour not by using a theory but instead we predict and explain someone's behaviour by imagining how we would act in a comparable situation. The simulation theory claims that our reasoning about minds and behaviour of others is not significantly different from putting ourselves in their shoes. Those who support this standpoint are of the opinion that no full-blown theory of the mind is ever needed and they claim that contrary to the assumption of eliminative materialists, no theory of the mind exists that could one day prove false.

3.4.3 *Concluding thoughts:*

Eliminative materialism has consequences not only for our conception of mind, but also for our understanding of morality, action, social and legal conventions, and practically every aspect of human activity. Jerry Fodor *(1987:XII)* comments: "If common-sense psychology were to collapse that would be, beyond comparison, the greatest intellectual catastrophe in the history of our species."

Of course there is nothing wrong with science and technology as such. I am only referring here to an ideological belief in techno-science that distorts our understanding of ourselves and the world we live in. When truth or morality or political action becomes "legitimised" only by their subservience to "science", for example we are clearly confronted by the ideology of scientism. It seems quite possible that eliminative materialism, in its beholdenness to the redemptive power of neuroscience, and its whole-sale rejection of common sense experience of ourselves, is nurtured by a scientistic credo.

Eliminative materialism depends on the development of a radical scientific theory of the mind, and it also appears that radical theorising about the mind rests upon our taking seriously the possibility that our common sense perspective may be profoundly mistaken. At this stage, it is perhaps useful to highlight the link between eliminative materialism and another much larger and more powerful ideology. The latter cannot be characterised as a disciplinary ideology, nor as (just) a mainstream philosophical ideology. What I am referring to here, is the role that ideological commitment to science and technology plays in western culture as a whole. [7]

Returning to eliminativist ideology, it seems clear to me that one of the things that "talk of neuronal activity" causes to "end" as a concept, (formula (20) above) is the very concept of personhood. The question arises, however, as to whether personhood does not enter by the back door, so to speak, to function as a hidden metaphor for the brain for as far as agency is concerned. The brain replaces the person and the brain becomes a sort of homunculus, a little person resident in the brain.

One also thinks here about talk of "mother nature", of the various purposes of the brain and so on. The ideology also destroys embodiment that plays a

major role in our concept of the world and ourselves. Churchland uses the formula. We can depict this fusion within eliminativist discourse as:

(21) NEURAL ACTIVITY ?

/

[PERSONHOOD]

I think that many of the difficulties of eliminative materialism can themselves be eliminated if we amend the kind of naturalism Churchland espouses. The "weak naturalism" that I have in mind here, does not hold a dualist view of mind-brain, but does hold that talk of "mind" cannot (now and possibly ever) be translated "word for word" into the language of neurology. The weak naturalism to which I am alluding, would subscribe (among other formulas) to:

(22) BRAIN ? CAUSES ? MIND

Yet it must be admitted that we are dealing with the unknown – and perhaps the unknowable – as the formula does not explain or clarify the mechanism or process by which the causation takes place. There remains a mystery: the well known concept "emergent" is used to explain mental events, but the exact mechanism whereby something is emergent is unknown.

3.4.4 *Folk-psychology*

As the elimination of folk-psychology is so important to eliminative materialism let us once more briefly return to this theme. According to Churchland the recognition that folk-psychology is a theory provides a simple and decisive solution to an old problem, the problem of other minds. Paul Churchland *(1990:123)* writes: "Not only is folk- psychology a theory, it is so obvious a theory that it must be held a major mystery why it has

taken until the second half of the 20th century for philosophers to recognise it. The structural features of folk-psychology parallel perfectly those of mathematical physics; the only difference lies in the respective domain of the abstract entities they exploit – numbers in the case of physics and propositions in the case of psychology".

This is perhaps the most radical support today for the idea that everyday experience constitutes a theory - an idea that I had previously rejected as a fundamental misconstruction of the pre-scientific attitude. Not everyone accepts folk-psychology as a theory. Against the assumption that folk psychology is a theory Clarke compares *(1996:98)* folk-psychology to the function of a thermometer. A thermometer reveals a specific state (someone's temperature) and not a particular illness. Clarke *(1996:98)* writes: "We may see folk-psychology as a device whose purpose is to inform us ONLY of the overall states of knowledge and motivation of other agents. For most social and daily purposes we care not at all about the specific details of inner representational form or neural configuration. It is a more coarse grained level of detail that folk-psychology is adapted to provide." Nevertheless I will for a moment follow the Churchlands further down this path to see where it leads them.

Churchland *(1998:299)* describes folk psychology as: "Our commonsense framework for understanding mental states and processes." Paul Churchland *(1990:121)* further elaborates that, "Folk-psychology's function, in conjunction with its background laws, is to provide explanations/ dictions/understanding of the individual's behaviour, and it is credible to the degree that it is successful in this regard over competing hypotheses". So the belief that others enjoy the internal states comprehended by folk psychology is a reasonable belief.

Folk-psychology allows each of us to understand others as well as we do, because we share a tacit command of an integrated body of lore concerning the law-like relations holding among external circumstances, internal states, and overt behaviour. Churchland *(1986:299)* continues: "Folk-psychology is common sense psychology; the psychological lore in virtue of which we explain behaviour as the outcome of beliefs, desires, perceptions, expectations, goals, sensations, etc." According to Churchland the pre-eminent elements in folk-psychology are belief and desire.

Churchland also suggests that according to folk-psychology the idea that knowledge of other minds has no essential dependence on knowledge of one's own mind. The generalisations of folk-psychology are rich and complicated and thus folk-psychology as a framework of understanding is very complex. One must not forget that folk-psychology is where scientific psychology began. As to the origin of folk-psychology Churchland states that "The mind-brain may have an innate disposition to favour and "grow" the rudiments of certain folk theories, including folk psychology and folk physics."

Paul Churchland *(1999:61)* writes: "The identity theorist expects that folk-psychology will be smoothly reduced by complete neuroscience, whilst the dualist expects that it will prove irreducible to neuroscience, by dint of being a non-redundant description of an autonomous, non-physical domain of natural phenomena. The functionalist in turn expects it will prove irreducible on the grounds that the internal economy characterised by folk psychology is not, in the last analysis, a law-governed economy of natural states, but an abstract organisation of functional states, an organisation instantiable in a variety of quite different material substrates."

These are some of the theoretical views on folk-psychology that are located within or around the ideological frame of eliminative materialism. It is of

some importance to note that an ideological frame, like the one we are investigating here, can in fact cause opposing views to be generated. This is to be expected, given the extent to which ideology always tends to push a perspective as far as it will go.

In this subsection, I have attempted to describe, in terms of a theory of ideology, the ultimate commitment of Churchland's discourse. These commitments form a framework which comes to expression in definitive key formulas, while the latter are simultaneously "coloured" by the framework. We have also seen how key formulas are surrounded by key metaphors, whose interpretation is equally dependent on the ideological framework.

By means of key formula analysis I hope to have shown that the eliminativist position can and should be "deconstructed" (to use Derrida's famous term). In essence, such deconstruction reveals that the logosemantic or key subject (neurobiology) is not capable of sustaining the enormous weight that is placed on it - in technical terms, the domain that it is supposed to operate on. And the strategy to proclaim much of this weight as simply "eliminated", fails in the face of our practical and theoretical experience.

Notes.

[1] Whether we actually introduce a key formula for Churchland which specifies physics and/or the physical in the logosemantic subject (as is the case with Chomsky for example) remains to be seen.

[2] The implication here is of course that something like logosemantic theory is indeed also grounded in neural activity. One might speculate also about the rootedness of logosemantic structures in, ultimately, the structure of the human brain.

[3] This is not to say that our everyday experience cannot become more developed as culture and societies develop, and as scientific knowledge "filters down" into

ordinary everyday consciousness. The point is that such a broadening of our naïve experience still retains the character of everyday "working" knowledge.

[4] Eliasmith nevertheless points out that connectionism can be explored as a useful metaphor, keeping in mind his warning about "real biological networks."

[5] In the discursive deep structure framework the ideology analyst does not presume his/her own freedom from ideology - even in the critical analyses that are being made of target discourses. One has to proceed with critique as best one can - maintaining a communicative openness to others when they may claim to find ideological fixations in one's own critique of ideology.

[6] Of course, in terms of the actual history of philosophical ideologies, Descartes and Hume belong to the early modern and the classical/enlightenment period respectively. The ideological difference between them is caused by the rationalist versus empirical divide, with their differing key formulas (appealing to "mind" and "experience" respectively).

[7] There is a vast literature in cultural philosophy and critical sociology, that attests to this ideological function of science and technology. By way of arbitrary example, I will only refer to the works of Dooyeweerd, Heidegger and Habermas.

Chapter 4

CHURCHLAND AND THE DEEP STRUCTURE OF OTHER DISCOURSES ON MIND

4.1 *David Hume*

Patricia Churchland declares a fondness for the philosophers Aristotle, Hume and Peirce because they were a whole lot broader in their interests and a lot more curious about nature in general than are many of today's mainstream philosophers. She describes them as clear and sensible, logical and bold. The danger here is of her not taking into account, in spite of certain resemblances, the radical ideological differences between these and other thinkers in the technical sense of ideology-theory. The sphere of theoretical philosophical ideologies encompasses arguably about 60 or 70 different ideological frameworks, from Pythagoras to post-modernity. Within each framework we find guiding key formulas. It is also important to note that the same ideological frameworks can harbour differing formulas. For example Foucault and Derrida, while sharing the post-modernistic or post-structuralist ideology, opt for different key subjects (knowledge, power and personhood in Foucault, and semiotic "otherness" in Derrida). On the other hand different ideological frames can give the impression of the same formula, e.g.:

(23) FORM ? GROUNDS ? KNOWLEDGE

that will be understood differently, in say, structuralism and classical Platonism. [1]

Churchland *(1986:244-247)* pays special attention to Hume. She sees Hume's position as follows: Hume together with John Locke and George Berkeley are the well-known empiricists of the eighteenth century, and their topics of inquiry included the nature of knowledge, the principles governing the

accumulation of knowledge, its limitations, and its logic. Simplified, their theory of knowledge revolved around two kinds of things we can know about:

(1) The nature of the empirical world (matters of fact; empirical propositions).
(2) The relations between these ideas (matters of logic and mathematics; analytic propositions).
The empiricists are convinced that only observations and experimental reasoning (a form of materialism) can lead to factual knowledge. Knowledge thus depends on experience of perceptions and the analyses of the different aspects of what is perceived e.g. numerical, physical, cultural etc.

According to Churchland, this type of philosophy is to be considered a form of materialism as these authors were convinced that sensory perception could give rise to knowledge. From my own point of view I must remark that it is problematical to see how the affective aspects of the mind like belief, love, hate etc. fit into this scheme – and this goes for the conative aspects like drive and motivation as well. It appears that Churchland wants to consider, to a greater extent, empiricism as akin to eliminative materialism.

A general key formula for various versions of empiricist ideology is:

(24) SENSORY EXPERIENCE ? PRECEDES ? KNOWLEDGE

The problem with this formula is that the critics of positivism (especially Popper) have shown that relevant scientific observation must in fact be preceded by a theory or hypothesis:

(25) THEORY ? PRECEDES ? (SCIENTIFIC) OBSERVATION

Implicit in empiricism is the assumption that our sense data faithfully represent reality. Churchland (1986:247) finds that: "This is interesting because it implies a criticism concerning the adequacy of a science of the mind that assumes that cognition is fundamentally logical (and language-like) in nature. To understand how the mind represents and how representations are transformed and reconfigured it will be necessary to investigate scientifically the causal principles that in fact govern the mind's operation." She thus seems to find support for her viewpoint in the reasoning of Hume.

On describing Hume's enthusiasm for a science of mind, Churchland quotes the following which she finds has a decidedly contemporary ring: "For me it seems evident, that the essence of the mind being equally unknown to us with that of the external bodies, it must be equally impossible to form any notion of its powers and qualities other than from careful and exact experiments, and the observation of those particular effects, which result from its different circumstances and situations" *(Hume 1739:introduction; quoted by Churchland 1986:27).*

As is well known Hume was confronted by the problem that the "self' is not something one can observe. If the self is therefore a mental construction, what are the properties of this construction, and where does it come from? Churchland is of the opinion that we have the advantage of addressing Hume's questions within the framework of neuroscience, where thinking is something the brain does. Therefore thinking of oneself as a thing enduring through time is also something the brain does.

Contemplating the relation between eliminative materialism and Humean empiricism, it seems important not to overlook the crucial difference

between the key formulas at issue. For all the apparent resemblances, it is clear that "sensory impressions" can in no way come close to the eliminativists chosen point of departure (the subject of Churchland's key formula): not the passive registering of the organism, but the activity of its primary organ, the brain. For Hume it was about the furnishings of the mind; for Churchland it is about the mechanisms of the brain. The difference in key formulas allow for the differences in appropriate metaphors.

4.2 *Immanuel Kant*

Immanuel Kant's philosophical training was based on rationalism, but as a philosopher he came into contact with the empirical philosophy of Hume. For a prolonged period he pondered upon these two opposing paradigms and ultimately created a framework in which elements of both rationalism and empiricism could fit.

Kant called for constraints in epistemology because he acknowledged that our access to the world is always a mediated access, access through our own understanding of the world. He also concluded that judgment in science does not come out of reality, but is something which we contribute to reality. Kant agreed with Hume when he said that if the problem were to show how the mind might obtain a faithful copy of reality without mediation, the problem would be unsolvable.

In terms of key analysis we can roughly depict the Kantian formula as follows:

(26) MIND ? FORMS ? REALITY

Churchland *(2002:368)* comments that "Kant realized that the mind-brain is not just a passive canvas on which reality paints. The brain organizes,

structures, extracts and also creates." Kant thought that categories used by the mind were in some sense *a priori* (universal and essential). Especially interesting is his insight that the mind's knowledge of itself is mediated: the mind is not transparent to itself. This means that mere introspective awareness does not yield truths about the way the mind works. Yet the apprehension of the inner world is more basic, privileged, and immediate than our apprehension of the outer world. Kant believed that our knowledge of both outer objects and inner objects are the same, and that there is nothing epistemologically unique or sacrosanct about introspectively-based beliefs. Kant was convinced that to the degree that the "workings of the mind" would become knowable at all, it would be philosophical reflection that would yield the central figures of that knowledge.

Neo-Kantians later claimed that psychological investigation was appropriate to learning the mind's operations and that it would yield empirical principles characterising its functions and not *a priori* truths. Conformity with the laws of logic is essentially rationality, and those laws cannot be equated with empirical truths of how the mind in fact operates. The conclusion was that the laws must be a priori truths. Frege *(1952)* and the logicians rejected the idea that the laws of logic might in some sense be dependent on the empirical principles characterising the mind's functions. Later philosophers like Feyerabend did not accept the logicians standpoint, which had a powerful influence on philosophy at that time, and suggested that if our beliefs about ourselves are mediated by concepts, then the question can be raised as to whether the concepts are adequate to their task and whether our beliefs about our inner world can be improved upon by science in the same way that our beliefs about the outer world are improved by science.

Churchland *(2002:57)* sees causality as a major problem for Kant. He realised that he needed to avoid the obvious objection to making causality an entirely subjective matter, yet also recognised the strength of Hume's arguments. He aimed to figure out how necessity could be a real feature of events, yet be of the subject – as part of the "lens" through which we see the world. For Churchland this proved to be an impossible goal. She claims that causation as a metaphysical problem has remained unsolved. Non-metaphysical issues regarding causation have allowed progress and it is accepted that a given effect can have multiple causes and that unrelated events can have a single cause. Churchland *(2002:57)* considers it plausible "That evolutionary biology may hypothesize that brains have evolved the capacity to infer causality from certain patterns of regularity observed in experience."

Churchland is convinced that Kant is a major resource in opposing the foundations of the later logical empiricist philosophy. She thinks *(1998:275)* that "liberated philosophers both from the constraints of holding fixed the current meaning of certain words and from the limitations of what can now be imagined. It showed the sterility of limiting what can be discovered in science by what we currently mean." Here we see Churchland's opposition to a philosophy that anchors its key in linguist meaning.

Finally, when comparing the Humean and the Kantian key formulas to that of eliminative materialism, it seems clear that the eliminativist position is in fact much closer to (Kantian) rationalism than to (Humean) empiricism. The deciding factor is the <u>forming</u> activity of the mind that is the cornerstone of Kant's philosophy. Since Kant, an important question has arisen, in how much the brain itself contributes to the character of what is represented. Churchland maintains that the gap in traditional philosophical questions about knowledge and empirical strategies for exploring how brains learn, remember, etc. has been narrowed by progress in empirical

psychology and neuroscience. She feels that the time is ripe for neuro-epistomology "As a bridge discipline, neuro-epistomology is the study of how brains represent the world, how a brain's representational scheme can learn, and what representations and information in nervous systems amount to anyway". (Churchland, (2002:270). In this way Kant's question may one day be answered.

4.3 Charles Peirce

Charles Peirce is considered the founder of American pragmatism, and the originator of the theory of signs which he called semiotics. He was also known as a logician. He is the third of the older philosophers admired by Churchland. Peirce lived from 1839 to 1914 and he is described by Churchland *(1986:249):* as "the visionary pioneer of pragmatism". Churchland (1986:249) states: "He thought the idea of unknowable reality was metaphysical tomfoolery and concluded that the only reality is the reality discovered by science and that the truth about nature is what science at the limit of inquiry will say about nature. The completed science is a true description of reality."

Recalling the structural link we posited earlier in this study between the ideological supremacy of science and the eliminativist elevation of brain sciences, we can expect the scientism of Peirce to be corroborated by Churchland. [2]

In Peirce the completability of science was an idealised conception – we may not in fact ever reach that end. Churchland *(2002:39)* seems in agreement with Peirce when she states that: "He cautioned against the idea that there is a rock bottom foundation to all science, where metaphysical reflection is the single tool for laying that foundation." She obviously also follows him in his view. (One has only to think of the "appearance" character that autonomous mental states have in Churchland's view), and

that the distinction between reality and appearance reduces as science evolves.

4.4 *John R. Searle*

Inthe philosophy of mind, John R. Searle is an outspoken antagonist of reductionism and the materialistic view which he considers fashionable but implausible. He states that the materialistic views share a hostility towards the existence and mental character of our ordinary mental life, that they all attempt to downgrade ordinary mental phenomena such as belief, desires, intentions etc., and that they cast doubts on the existence of general features of the mental such as consciousness and subjectivity.

A major contribution of John Searle to the understanding of the mind is his theory of intentionality. He stresses the fact that activities of the mind are always directed at something and thus have intention.

In his book "The Rediscovery of the Mind" he discusses his view of consciousness fully in chapters 4 and 5 and his vision can be summarised as follows: His first basic principle is that consciousness is irreducible. It is a first person, subjective phenomenon and cannot be reduced or eliminated in favour of a third person, or by objective talk about neural events – it has subjective qualities. Searle gets to his radical irreducible-to-brain-states conclusion on the back of a premise he takes to be obviously true: whereas science might find the reality behind the appearance for objective phenomena - fire, light, life, etc. - in the case of consciousness, the appearance is the reality. He is convinced that if the appearance - seeing blue, feeling pain - is the reality, then nothing neuroscience can discover will ever show anything about the pain that is more real than feeling it. Feeling the pain is all the reality there is to pain.

At this stage we may venture, from the viewpoint of key analysis, to say that it appears as if Searle wants the concept of consciousness in a subject and not in a domain position (in the technical sense of these terms as explained previously)

According to Churchland, Searle's premise has an obviously true bit and probably false bit, and the second slips in under the skirts of the first. What is obviously true is that sensations are real. Anybody's pains are just as real as Searle's. What is troublesome to Churchland is the idea that all the reality there is to a sensation is available through having it. She asks the question: how could anyone possibly know that? And she suggests instead a rather simple alternative: a sensation of pain is real, but not everything about the nature of pain is revealed in introspection: its neural substrate, for example. I tend to agree with Churchland on this point: feeling is but one of the aspects of the whole pain episode. One must thus concede that Churchland is on the right track here when she disagrees with Searle. We must hypothesise, again in terms of key analysis, that Searle's position is given by:

(27) CONSCIOUSNESS ? ENCLOSES ? EXPERIENCE

But such a formula is problematic precisely in the way Churchland indicates.

Searle's second basic principle is that consciousness is as much an ordinary biological phenomenon as digestion. He accepts that brain processes at the neural level cause conscious states, thus that they are just features of the neurobiological substrate; it is not an effect separate from the brain process causing it. He labels the process *"Biological Naturalism" (1997:210)* He accepts that non-physical things do exist such as mental information processing, unconscious inferences, mental models, three dimensional

descriptions, language of thought and universal grammar. He also accepts that brain function is necessary for their existence. *(1998:228)*: "The brain is the organ of the mental and has the capacity to cause and sustain conscious thoughts, experiences, action, memories etc." He differs from Churchland when he states that the brain causes conscious states, but that conscious states are not explainable in terms of brain states. He writes *(1992:132-133)*: "Although the brain causes conscious states, any identification of conscious states with brain activities is unsound. There are correlations between subjective states and brain states, and although correlations can be evidence for causality they are not evidence for identity."

At this stage we may ask, from the perspective of key formulas, whether Searle is in fact philosophising under a formula which has consciousness in the dormant position and brain in the subject position hascontradicting our previous opinion. However, given the central importance of consciousness in Searle's philosophy, I would rather venture to say what is really at stake is something like:

(28) [BRAIN ? CAUSES ? CONSCIOUSNESS]

where the whole structure in square brackets forms the real key subject – with the possible not yet stipulated here. Searle's premise has much in common with Churchland's in the sense that both see the brain as the direct cause for the existence of mind. However, they differ at the point where Churchland's formula has neural activity actually constituting mental states, or even "ending" them (in the sense explained earlier).

According to Searle *(1998:xi),* consciousness and intentionality are caused by lower level neuronal processes in the brain, and consciousness is the central mental phenomenon. Searle's reference here to the role of

consciousness in the mental world, is an interesting one. It seems to support the further elucidation of his "key logic" as depicted below:

(29) [BRAIN CAUSES CONSCIOUSNESS] ? ENTERS ? THE MENTAL

Such centrality seems to be in "key conflict" with the status Churchland accords to NEURONAL PROCESSES.

Churchland does consider John Searle and Roger Penrose both as neural "nay sayers" but for different reasons. Each has a distinctly articulated mistrust of the prospects for success of the neurobiological project and neither rejects the value of neuroscience in contributing to our understanding of consciousness and the mind. Both believe that a fundamental change in science is needed to do justice to the phenomenon of conscious experience. (This standpoint, also supported by Chomsky, is a distinct possibility.) Often a basic assumption in a basic science must change to allow the less basic science to develop, and for both to move in the direction of possible unification. The idea that present basic science must change before such development may take place is a basic assumption shared by reductionists and anti-reductionists.

Searle suggests that science as it currently exists is not equipped to cope with the ontological distinctness of conscious awareness. He claims *(1998:117)* that "When we treat the irreducibility from the materialistic or the "property" dualistic point of view we are left with the universe that contains an irreducibly subjective physical component as a component of reality."

Searle's antagonism against neuro-reductionism is clearly laid out by Churchland in the following line of supposed reasoning:

(1) If we get an explanation of conscious states in neurobiological terms, it means we have a reduction.
(2) If we have a reduction, then conscious states are not to be considered real - they are eliminated.
(3) But conscious states are real - any idiot knows that. Conclusion: we cannot explain conscious states neuro-biologically.

Churchland replies that the undoing of the argument is the falsity of its second premise: that reductions are explanations of macro-phenomena in terms of micro-phenomena – it does thereby not say that there is no such thing as the macro-phenomena explained. Sometimes scientific developments are eliminativist, for example when it was shown that phlogiston was non-existent, but this is generally not so.

4.5 *Thomas Nagel*

Churchland *(1986:327)* summarises Nagel's viewpoint "For Nagel there is something special about having an introspective capacity - a capacity to know one's thoughts, feelings and sensations from the inside, as it were. The experience of the quality of pain, the redness of red, has a phenomenological character - one's point of view is thus a subjective point of view. It is the qualitative character of experiences, sensations feelings etc. to which we have introspective access, and according to Nagel this is not reducible to neural states." Nagel was of opinion that mental states resist reduction because introspective access to them has an essentially different character, yielding essentially different information, than external access does via neuroscience. Churchland *(1986:327)* formed the opinion that "The argument does exert a powerful attraction, but as stated it is still teasingly vague. In order to see exactly how it works, it is necessary to set out a more precise version."

Nagel *(1974:435-450)* published a now well-known paper entitled "What it's like to be a Bat." Churchland examined a set of arguments she extracted from this paper and discussed them in *Neurophilosophy*. *(1998:328)*. The following is her summarised analysis of Nagel's argument:

a) "The qualia of my sensations are knowable to me by introspection.
b) The properties of my brain states are not knowable to me by introspection.

Therefore (by Leibnitz' Law)

c) The qualia of my sensations are not the properties of my brain states."

A second argument, complementary to the first, also seems to be in play:

a) The properties of my brain states are knowable by the various external senses.
b) The qualia of my sensations are not knowable by the various external senses.

Therefore:

c) The qualia of my sensations are not equal to the properties of my brain states.

She has no quarrel with the first premise (that the qualia of my sensations are known-to-me-by-introspection), especially as qualia are defined as those sensory qualities known by introspection. The second premise (that the properties of my brain states are not knowable to me by introspection) however, she finds problematical and the first question she raises in this regard is whether or not mental states are identical to brain states. Nagel seems to run the risk of underestimating the coherence between mental states and brain states whilst he honours the uniqueness of both.

Churchland argues that if mental states are identical to brain states, then whenever one introspects a mental state, one also introspects an identical brain state. According to her one may not describe one's mental state as a brain state: "Whether one does, depends on what information one has about the brain, not upon whether the mental state really is identical to some brain state. The identity (of a mental state) can be a fact about the world independently of my knowledge that it is a fact about the world." *(1998:239)* And "identities may obtain even when we have not discovered that they do." Again we see this line of thought more or less dictated by key formula (19) above.

Churchland's conclusion is that the only justification for denying that introspective awareness of sensations could be introspective awareness of brain states derives from the assumption that mental states are not identical with brain states, something the argument is supposed to prove. The same applies to the second argument.

From a key-formula perspective, the important thing to note about Nagel's position is the way in which he makes use of the classic attributes that usually qualify the elements of a key formula. [3] Up to now it has not been necessary to bring up the matter of key attributes. Here however, I will only point out the role of one of the binary pairs of such attributes, namely knowable/unknowable. If Nagel leans toward a formula where consciousness as a mental state is irreducibly in the subject position, then it appears that this subject is (alternatively) qualified as knowable in terms of introspection. If Nagel would want to subscribe to a formula stipulating that mental states in some or other manner transcend brain states (the latter in the domain position), we can see how he would bring unknowable into the attribute selection on the domain side (again related to introspection). Remarkably, when Nagel shifts from introspection (as his point of reference) to the role of external sensing, the functions of knowable versus

unknowable immediately change place. The strategy of Churchland is merely to relativise the whole issue of “unknowableness”: this may only be a consequence of our present lack of understanding.

4.6 *Daniel Dennett*

Both Churchland and Daniel Dennett are reductionists but differ completely in their approach to the subject. Dennett is a cognitive scientist. He supports the tradition in philosophy that epistemology - the study of knowledge, justification, and evidence - in the case of cognition can be pursued independently of a more inclusive study of the mental (with the possible exception of perception) or of the biological systems in which knowledge was acquired. He therefore believes that cognition is an independent domain, a set of phenomena, principles, and mechanisms that could be studied in its own right. Cognitive scientists have the conviction that cognition can be studied empirically and scientifically, with observation and experiment replacing (or at least augmenting) the role that *a priori* reflection and conceptual analysis play in *traditional* epistemology. Churchland, a student of neuroscience, is in a sense more a supporter of traditional epistemology in an explanatory sense, as well as a cognitive scientist and a neuroscientist. Also within her own reductionist context, Churchland is convinced that cognitive science needs neuroscience.

Both she and Dennett believe that consciousness is the result of evolutionary development, although they differ regarding the evolutionary process as such. Dennett supports selective determinism as advocated by Dawkins *(1991)* where the basic principle is that natural selection works through gradual, small-in-effect, step-by-step, genetic change; whilst Churchland sides with historical contingency where it is accepted that evolution can be can be influenced by other factors in addition to natural selection and that it can sometimes occur in large steps, as advocated by Stephen Gould *(1983).* She supports a molecular type of evolution. [4]

There is the suggestion that conscious representations are more broadly accessible in the brain than are non-conscious representations. The flexibility of cognitive function can be explained in terms of information distribution. Dennett *(1993:111)* argues that wide accessibility constitutes consciousness. He came up with the idea of the *multiple drafts model* that was elaborated upon by Baars *(1988)* with his *global workspace model*. Dennett accepts this elaboration. Baars' suggestion was that certain neural networks are connected so as to have what amounts to a shared workspace. In testing this model Churchland thought that the difficult part of the task would be to specify what "global access" means in neuronal terms.

The key to information that is to be made accessible has been broadly linked to certain anatomical properties: the existence of long distance neurons in the parietal cortex, cingulated cortex, frontal cortex and temporal cortex. These long distance neurons can spread information widely. But Churchland *(2002:160)* has certain reservations: "First it is unclear whether the shifting neuronal population, whose activity allegedly constitutes awareness, is the sending population (workspace neurons) or the receiving population or both the sending and receiving populations." Secondly she points out that there are many long axon neurons in other areas and areas that are densely populated by neurons, which have not been shown to be part of the global workspace. Churchland *(2002:160)* is of opinion: "So defining the workspace neurons by means of these specific structural criteria is less than satisfactory." She also quotes the example of eye movements where the signals are widely distributed and thus widely accessible, but the problem is that we are not aware of eye movements. She concludes *(2002:161)* "Unfortunately, putting the global workspace hypothesis under scrutiny makes it less, rather than more, comprehensible in neural terms." She further expresses the opinion that Dennett's story of global access is complicated by his conviction that the consciousness we

humans have is not shared by animals, because they do not have language and cannot talk to themselves.

Daniel Dennett *(1993:218)* theorises that conscious human minds are more or less serial virtual machines implemented on the parallel hardware that evolution has provided for us and that there is something at least remotely like a Von Neumann machine in the brain. In key formula/metaphor terms we will thus again have a construct like:

(30) MIND/BRAIN ? [MACHINE (COMPUTER)]

From my own point of view (as a neurosurgeon) I will agree that certain brain-functions look like or resemble a Von Neumann machine, like the control of vegetative functions such as blood-pressure, control of blood sugar levels, etc., but consciousness does not fall into this category. There are far too many things that affect consciousness that cannot be found or built into a computer or a computer-like entity. Can emergence or supervenience or emotion be built into such an entity? Amongst other things Dennett seems to ignore emotion, culture, belief etc., and the role they play in perception and thus consciousness. Churchland accepts that the brain computes but she does not (as we have seen) support the strong computerism metaphor (where metaphorical applicability gets pushed to problematic lengths) .

In trying to reconstruct a key formula in Dennett's case it first of all is clear that Dennett regards the mind and consciousness as a "right-hand" domain and not a "left-hand" subject concept, in the technical sense of conceptual key-formulas. This means that mind is something that is in need of a foundational, or causal, or unifying, etc. factor, not the other way round. This implies that Dennett does not hold mind and consciousness in the high regard that theorists usually hold the initial part of their key formula. A

clue to Dennett's particular key - or, at least one of his ontological keys - is provided by the central importance he accords to natural selection.

Of decisive importance in Dennett's view (quoted above) is that natural selection is a "universal acid", unifying life, meaning and "purpose" within the realm of (biological) cause and effect, "mechanism" and physical law. On the grounds of this statement together with many others, one can guess at the key formula in Dennett's conceptual apparatus as roughly the following:

(31) EVOLUTIONARY BIOLOGY ? (GROUNDS/ENCLOSES/UNIFIES, ETC.) ? CONSCIOUSNESS, MEANINGS, CULTURE, ETC.

The biological laws that Dennett's discourse specifically focuses on are those that sustain evolutionary selection processes. At the same time, our elucidation of Dennett's key underlines the precise form of reduction that his thinking falls prey to. The level of uniqueness of phenomena like language, life, culture and probably many other things as well, tends to get lost in the all-pervasive causality of natural selection. Instead of, say, linguistic or cultural principles having linguistic or cultural consequences, it is really biological principles that are held to have these kinds of (mere) effects. Of course biological laws are of foundational importance in our world. But they should not be promoted in such a way that our search for principles on other levels is led astray.

Doubtlessly Churchland will accept an evolutionary basis for brain structure. But the decisive matter here is that in Churchland's key formula, it is not natural selection as such, but rather the neuronal machinery of the brain (as it stands) that forms the point of departure for her theorising. This is an interesting point. It shows that reductionists can differ in their emphasis, when it comes to the continuum leading from the start of natural

selection to the brain of evolved humans. Similarly, the machine metaphor can apply to both points of the continuum, or to the whole of the continuum itself.

When we compare Dennett and Churchland with regard to their key formulas, it appears that both operate with a biological determinant. For Dennett, however, this is directly coupled to the process of natural selection, whereas for Churchland the link is to neural networks. In terms of "key logic", Dennett does of course point out that the brain's neural structure is the direct result of natural selection.

Turning now to metaphor analysis, the basic finding here is that the principal "left-hand" concept of the key formula posited in (30) above immediately attracts metaphorical forms of interpretation, right from its inception and in this case it is clear that the laws of evolutionary selection are conceptualised as a kind of *mechanism.* It is from this original link that Dennett's "computerism" derives. The trouble with Dennett's root metaphor is not so much the use of the particular metaphor, but rather the problematic key formula it complements, as well as the one-sidedness of the metaphor itself. In other words the very primacy of this particular metaphor (in Dennett's discourse) prevents it from being relativised by other metaphors. Such relativisation is necessary to counter a mechanistic kind of thinking.

Our finding in terms of the metaphor issue has to be that it is not the machine or computer metaphor as such, which automatically indicates strong reductionism, for the use of such metaphors can, in principle, be counter-balanced by other metaphors. It is rather the link of mechanistic metaphors with a certain kind of key formula that points to reductionist thinking. This would be a formula that "cancels out" the relative uniqueness of certain capacities/levels that appear on the right-hand side of the formula (like moral or linguistic or artistic rationality for example). But

this cancellation means that reductionists cannot really contribute to theories that seek to explain how these different kinds of rationality work, in term of concepts that are not those of brain biology.

Ironically this is the very kind of thinking that Dennett ultimately shares with his villain of the mind story, Descartes. (Descartes limits this metaphor to the body, as distinct from the mind/soul.) The mechanistic root metaphor runs into all kinds of conceptual difficulties. For example, it is difficult to see how a discourse on the "mind machine" can itself be more than a kind of mechanical product - but without "designer" intent or supervision behind it.

Using the machine metaphor with reference to the construct (31) above, we can say that the latter is in effect part of the particular "conceptual machine" that produces Dennett-type discourse. We may speculate that this machine is itself, in the last instance, a product of the human mind/brain. (Possibly even tied to a given level of what Chomsky has called the science-forming faculty of the brain.) Of course, what this structure imposes on the key formula, is the general "XYZ" form (of the three-part key formula) and not the content of any given format.

Finally, we come to the ideological framework in which the key formula and metaphor system that I have analysed here comes packaged. This (disciplinary-specific) framework can perhaps be identified as "ultra" or "radical" Darwinism (to use Eldrige's term). All of Dennett's basic assumptions with regard to formula and metaphor choices make sense within this framework. Compare also his professed admiration for a leading figure in the ultra-Darwinist paradigm, Richard Dawkins. Dennett's use of Wittgenstein, his "teleofunctionalism", his irritation with those who continue to view consciousness as a mystery:all of this fits together, in the worldview of the paradigm in which his conceptual formula and metaphor

function. A similar kind of "generative machine" is at work in Churchland's discourse, as we have seen. And it is only from within and in accessing such differing conceptual contexts that philosophers of mind can try to understand one another.

4.7 *Roger Penrose and Stuart Hameroff*

Roger Penrose, a mathematician, and Stuart Hameroff, an Arizona researcher on anaesthetics, believe the dynamic properties at the level of neurons and networks to be incapable of generating consciousness. They believe the key to consciousness lies in the quantum events in tiny protein structures - the microtubules - within neurons. In neurons the microtubules, found in all cyto-skeletons of the cells, have a number of functions, amongst them the transport of proteins up and down the axons and dendrites.

Penrose does not accept that human thinking is basically the same as computer action albeit an intensely complicated computer. A computer can only carry out algorithms that are systematically calculated procedures. As there are no algorithms for certain mathematical calculations that produce true statements, and mathematicians know when such calculations are true, he concludes that the brain does not follow any algorithm, or is "non-algorithmic". He thinks that this is also true for conscious activities in general - so the brain is more than a computer. In his opinion, to solve the problem of consciousness and thus the mind, some kind of non-algorithmic physics is needed and that this has not yet been found. (This is close to the idea of Colin McGinn.) In principle Penrose and Hameroff thus believe the nature of mathematical understanding transcends the kind of computation that could conceivably be done by neurons and networks.

According to Churchland and Grush *(1995)* Penrose's argument can be summarised as follows: Human thought is non-algorithmic and the thinker

is aware or conscious of the components of his thoughts. Conscious human thought, at least in some cases, perhaps all cases, relies on principles that are beyond current physical understanding, though not in principle beyond any future scientific physical understanding. Future theories of physics, in particular quantum gravity, can be expected to incorporate non-algorithmic processes, including thought (considered by them as a non-algorithmic process).

Although no adequate theory of quantum gravity exists, Penrose *(1994)* and Hameroff *(1998)* argue that microtubules, which are part of the cyto-skeleton of neurons, are the right size to support the quantum events envisioned and they have the right sort of sensitivity to anaesthetics to suggest they do sustain consciousness. Because microtubules appear to have one foot in quantum mechanics and the other in conscious thought, it provides a window for non-algorithmicity in human cognition. The conclusion they came to is that quantum gravity, or something similar, via microtubules, must play a role in consciousness and cognition.

Hameroff *(1998)* stresses the fact that reductionists have attempted to describe conscious experience as being embedded in physical reality in terms of modern physics. In this approach qualia become properties of space-time geometry at the fundamental Planck scale. A process occurring in the brain which somehow connects to Planck scale space-time geometry could thus solve the problem of consciousness. Hameroff thinks that a link between neural processes in the brain and fundamental space-time geometry is contained in the proposal for quantum computation in micro-tubules. He also thinks it is inevitable that the brain/mind be compared to a quantum computer because the development of quantum computer technologies can be synergistically linked to brain science at the nano-scale molecular level, and to fundamental reality at the Planck scale.

Penrose *(1994)* claims that future quantum physics could well point us in new directions of relevance to questions like the flow of time, for example. And this may have something to say for solving the questions and problems that arise from mentality. We do not know, according to him, the underlying physical laws essential to most of the sophisticated behaviour of the world we know - and his assumption is that the behaviour of conscious human beings depends on the very detailed nature of those laws.

All of this reminds one that historically the body/mind problem has always been compared to the current most advanced form of technological information possessing. For example, at the time of Freudian psychology hydraulic machines served this purpose, and going back to about the 17th century the same can be said for clocks. In any case, the key formula underlying the arguments of Penrose and Hameroff seems to be something like the following:

(32) [(QUANTUM) PHYSICS ? NEURONAL PROCESSES] ?
GENERATES ? CONSCIOUSNESS

(Where the operator arrow might take a value such as ground for example.)

Compare this to Dennett's formula:

(31) EVOLUTIONARY SELECTION ? CONSCIOUSNESS

and Patricia Churchland's:

(2) NEURON ACTIVTY ? THE MENTAL/CONSCIOUSNESS

What we find is that the common denominator of each of the three formulas is biological reality - only the specific type or form of this reality differs. The same problem I raised previously in connection with a jump from the purely biological to fully-fledged mental events, are again at issue here.

Churchland *(2002:196)* has the following to say about this approach: "The theory gives rise to the following questions:

a) Is there any hard evidence to support the theory?
b) Is the theory testable?
c) And if true will the theory give a clear and cogent explanation of what it is supposed to explain?"

She states *(2002:196)* that there is no direct evidence that anaesthetics have any effect on microtubules, but that there is plenty of evidence that points to proteins in the neuronal membrane as the principle site of action of anaesthetics. There is also no evidence that quantum coherence in microtubules exists, only that it might. Furthermore the existence of quantum coherence in microtubules cannot be tested in animals, only in a dish and the result would then be only of limited value. Her question is "Supposing the theory to be true, will it help us explain such things as recall of past events, filling in of the blind spot, hallucinations, and attentional effects on sensory awareness? *Somehow it might" (Churchland, (2002:197)*.

Churchland considers the explanatory vacuum as catastrophic. She is of the opinion that the theory has not been proven wrong but that it needs work. She states *(2002:197)* that "Whether it is worth additional work depends on how one assesses the theory's figures of merit."

4.8 *Colin McGinn*

Transcendental naturalism as applied to the mind/body problem tells us, according to McGinn *(1999),* that although consciousness can be seen as a natural emergent property of the brain, we lack the biological capacity to articulate such a relation. Insofar as consciousness is considered an emergent property of the brain, it represents as much a natural phenomenon as those studied by physics, chemistry, or biology. However, we are incapable of determining how such an emergence takes place. There is no doubt that naturalism is supported by many, amongst them Chomsky *(2000:7),* who distinguishes methodological naturalism from metaphysical naturalism.

Brain naturalism is a founding although partial approach to the consciousness problem. There are also other determinants, for example of cultural and social origin. Searle (as we have seen) also supports the idea that consciousness cannot be totally reduced to a natural law.

McGinn *(1999:xi)* is of the opinion that we have no theoretical grip on the mind and especially on consciousness. According to him, this is "because our intelligence is wrongly designed for understanding consciousness." We quite possibly need an additional faculty if we are going to understand the mind/brain link *(McGinn, 1999:52)*: It is not that the mind/body problem does not have a solution, but that its solution lies outside our cognitive abilities. Churchland does not share this opinion but as far as I can gather does nothing in an attempt to prove it wrong. If it makes sense to accept the fact that we have biologically imposed perceptual and motor limitations, then to me it makes sense to accept that we also have cognitive limitations.

Colin McGinn says the difficulty with solving the problem of consciousness and thus the problem of mind, is the fact that our senses are geared to presentation in the spatial world; they essentially present things in

space with spatially defined properties. He assumes therefore that the problem of the mind and consciousness cannot be solved because in our present day physics, mind and consciousness do not occupy space and we can therefore not establish a link between the body and the mind and between the brain and consciousness. He posits that unless our physics theory develops or changes so that consciousness becomes something physical (and thus occupies space), the problem will remain. How one is going to change being conscious of love, respect, belief etc. into something spatial seems an impossible problem. Like Searle, McGinn at the moment considers consciousness irreducible, but for different reasons.

McGinn believes that conscious awareness does not result from mere passive reaction to an incoming input. He supports the so-called "enactive" view of the mind, which holds that a stimulus as such does not cause perception. A response must first occur, and then act on the incoming signals to produce perception. Those who support computerism in philosophy of mind tend to not subscribe to this sequence of events.

McGinn *(1999:119-123)* sees the big bang as the moment that space itself came into existence and this gives rise to the question: how does space come from non-space and what kind of explosion could create space in an unlimited amount? He maintains that the spatial properties of the brain recognized in current physical science are insufficient to explain the properties of the mind and the generation of consciousness. The brain must have aspects that are not represented in our current physical world view, in addition to all the neurons and electro-chemical processes that are known to us. He assumes that to provide an explanation of the emergence of consciousness, we would need a conceptual revolution, in which fundamentally new properties and principles are identified.

Differing totally from Patricia Churchland, McGinn argues that to obtain further knowledge of the functions, physiology etc. of the neurons and their constituents will not solve the problem of mind and consciousness, because "The conscious state does not have an internal structure that is *defined* by its physical underpinnings. The mind is simply not a combinatorial product of the brain." *(McGinn 1999:58)*.

Churchland *(1998:271)* accuses Colin McGinn of remaining faithful to the "conceptual analysis" style in his approach to the questions of philosophy of mind. She describes the method as analysing the common concepts used in talking about the mental in order to discover answers - either answers about the true nature of the mental and how it differs from the physical, or answers showing that the original problem was after all a semantic misunderstanding. In my view though the point is that through word or concept analysis Colin McGinn and others may in fact discover ontological "category mistakes". Churchland describes her understanding of the method of analysis as that it begins by asking what is and what is not conceivable or imaginable by analysing whether something agrees with the existing meaning of the words in question, and determining the details of how ordinary people use the words in their concept of the matter in hand.

Turning now to the matter of some kind of key formula that underlies McGinn's philosophical discourse, several possibilities suggest themselves. If we focus on the broadest of these possible "key theories", much if not all of McGinn's work seems to rest on his notion of a certain kind of "unknowableness" that fundamentally limits human knowledge. Knowable/unknowable, as we have seen, is in fact one of the "classic" philosophical attributes that usually show up in key formulas, qualifing either the "left-hand" or "right-hand" term (respectively "subject" and "domain"). Thus we might posit the construct below.

(33) UNKNOWABLE (ASPECTS OF) REALITY ? TRANSCENDS ? SCIENCE

This does not mean that he doubts that consciousness as such is in some way connected to the biology of the brain. So he would presumably subscribe to:

(34) THE (BRAIN) BIOLOGICAL ? GROUNDS ? THE MENTAL

Recall in this connection, his acceptance of the "emergent" aspects of consciousness. However, what is very interesting, is that McGinn's anti-reductionist arguments would reject the formula:

(35) THE BIOLOGICAL ? CONSTITUTES ? THE MENTAL

These formulas clarify clearly the difference between Churchland and Colin McGinn. It can be said that it is this latter interpretation of the acceptance or rejection of the above formula that is crucial in the conflict between the reductionists and the anti-reductionists. In other words, the central issue is whether the biological merely "grounds" or is in fact "constitutive" of the mental. The first interpretation leaves room for an irreducible mental aspect. The second lets the mental crystallise into the biological. Reductionists would also reject the McGinn formula in favour of the *knowableness* (in principle) of the biological as the *constitution* of mental event.

Coming to the metaphorical aspect of discursive deep structure, McGinn warning against any conceptualisation of consciousness as if it was some kind of matter, is notable. He also cautions against an introspective study of the mind that models this study on ordinary perception. Again, in my opinion, the sensible attitude seems to be not to reject perception metaphors

out of hand, but to be aware of their inherent limitations, and also to continually try out *new* metaphors that can overcome the limitations of stabilised ones. An innovative metaphor/model move on McGinn's part, is the suggestion that the "pre-space" history of the cosmos can perhaps provide a kind of inverted model for the history of consciousness.

McGinn's key formula, stressing unknowableness, fits in with a special school that has emerged within the philosophy of mind, which is sometimes condescendingly referred to as the "mysterians". In the eyes of reductionists "mysterianism" would be a philosophical ideology. But this response seems to be dictated by reductionist ideology itself.

4.9 *Jerry Fodor*

Fodor *(1987:26)* believes that understanding what it is for a person to want something or to believe something, will not be helped by understanding neurons, circuits or anything else about how the brain works. This motivated him to reject firmly the relevance of neuroscience in this regard and to emphasise the importance of experimental psychology. He is convinced that psychology, as a science, is independent in its concepts and generalisations. The crux of his claim is that cognition, especially the psychological aspect, cannot be explained in neurobiological terms and will not be usefully explored by neuroscientific means. Cognition should be investigated by using behavioural measures. Churchland *(2002:26)* sums his position up as follows: "He is of the opinion that neuroscientific data have a bearing only on how the cognitive program can be implemented in a particular physical arrangement, but have very little bearing on the actual nature of the cognitive functions."

Fodor supports functionalism and a certain computerism as part of functionalism. Churchland *(2002:26)* comments that "The conceptual distinction between hardware and software in computerism does not

correspond to any real distinctions in the nervous systems. The fact is that in nervous systems there are no levels of brain organization identifiable as the software level or the hardware level." She admits that at many levels there are brain activities that can be considered as computations, but none of these levels can be singled out as the hardware level, nor are there any levels of brain activity that can be identified as a software level. She also feels that to turn one's back on a vast range of data that might be valuable in one's search seems "strangely puritanical. (Churchland, *2002:27)*:" She goes further *(2002:27)*: "In a curious way, brain averse-functionalism is methodically close to Cartesianism. In place of Descartes's *non-physical mental substance*, functionalism substituted software."

Churchland is convinced that neuroscience and cognitive science are co-evolving and that data from neuroscience has an impact on questions about the mind, also that this is motivated not by ideology, but by the rewards derived from interaction between the two.

From this very brief rendition of Fodor's views we might reconstruct his functional formula as follows:

(36) (THE) PSYCHOLOGICAL ? TRANSCENDS ? (THE) BIOLOGICAL\ [COMPUTATION]

A final thought on the computational model. If Chomskyan linguistics can indeed be considered as having revolutionised the study of language, it is a striking fact that the computational model has played a central role in this enterprise. Churchland's overall evaluation of computerism does not seem able to account for this heuristic success.

Notes

[1] As certain philosophical–isms like dualism or monism can usefully be construed as aspects of key formulas, it also becomes clear how dualism for example can be found in a wide variety of philosophical positions, ranging across the ages.

[2] Pierce's scientism is evident from his wholesale association of truth with science. Calling to mind the current ecological disasters that the world faces, it should be clear that the ethical import of decisions to be taken in this context, cannot itself be derived from technical scientific knowledge only.

[3] Attributes crop up in discourse surrounding philosophical propositions. The concepts are structured as binary choices from which a philosophical discourse may select the appropriate item. What it comes down to, is that dominating and dominated entities are regarded as either, one or many, simple or complex, finite or infinite, constant or changing, knowable and unknowable, universal or individual, necessary or contingent. The rules for attribute selection also allow for combining them "internally": that is having one specify the other.

[4] In terms of key formula attributes (to which I have just referred in the previous section), I should perhaps point out here that (another) binary pair of attributes that plays a crucial role in qualifying the elements of key formulas is the pair necessary - contingent.

Chapter 5
THE WAY FORWARD: A PERSONAL PERSPECTIVE

5.1 *Churchland's position in philosophy*

Patricia Churchland's position in the world of philosophy has become controversial in many circles. Some are of the opinion that the paradigms she promotes and propagates are of scientific nature and not philosophical, whilst others are think that whilst the mind/body problem remains unsolved it is of a metaphysical nature and therefore philosophical. Let us now look at traditional philosophy and how it has developed before we make up our minds regarding this matter and come to a final conclusion as to what Churchland's position is in this regard.

The central epistemological question, from Plato, on is this: *How is representation of a world by a self possible?* Our senses allow us to represent the external reality and even allow us to know that its initial appearance differs from what it really is. Inner knowledge, like outer knowledge, is conceptually and theoretically mediated, it is the result of complex information processing. The question now is: how is this possible and how is science possible? In key terms the problem (37) is posed.

(37) X ? KNOWLEDGE

The dominant philosophical tradition has been to resolve the epistemological puzzles by invoking mainly intuition and logic to figure out such things as the organisation of knowledge, the nature of mirroring of the outer world by the inner world, and the roles of reason and inference in the generation of internal models of reality. Epistemology thus pursued was the product of "pure reason":

(38) REASON ? KNOWLEDGE

where the operator can take different values according to different ideological positions: for example, ground in the empirical tradition versus forms in Kantian rationalism. Pushed to a rationalist *a priori* task - becomes a task of reflective understanding and limits epistemological reason. Empirical observations by psychologists and neurobiologists are typically considered irrelevant, or at least incapable of effecting any significant correction of the *a priori* conclusions. Churchland *(1999:135)* explains that "Plato, Descartes, and Kant are some of the major historical figures in this tradition; some contemporary figures are Chisholm, Strawson, Davidson and McGinn."

The *a priori* insights of the great philosophers should be understood, not as *the absolute truth* about how the mind/brain must be, but as articulations of the *assumptions* that live deep in our collective *conception* of ourselves. They can be revised.

In addition to asking how the self can know about the external reality, Kant asked: how is representation of a self by a knowing self possible? One of his important ideas was that the nature of the internal world of the self is no more than unmediated or given than is knowledge of the external world of physical objects in space and time. One can support these ideas when we consider the fact that receptors are the interface between the world and the brain and our concepts of what the universe is like and what we take to be the truth about the universe, are inexplicably connected to the response and characteristics of cells in the periphery. Our access to the world is always mediated access. In key terms this can be represented as (39):

(39) X ? (HUMAN) KNOWLEDGE
KNOWLEDGE **?** REALITY

(The values of the arrows are not important here.)

In a recent departure from this venerable tradition of *a priori* philosophy, some philosophers have argued that epistemology itself must be informed by the psychological and neurobiological data that bear upon how in fact we represent and model the world. This was first articulated by Quine *(1969:69-90)* with his "naturalism"

The response to naturalism by philosophers, psychologists, and some neuroscientists was:

- Philosophy is an *a priori* discipline, and the fundamental conceptual truths about the nature of the mind, of knowledge, of reason, etc. will come only from *a priori* investigations.
- Even if a naturalistic approach is useful for some aspects of the nature of knowledge and representation, the neurosciences in particular are largely irrelevant to the enterprise.

The fact that one should take relevant empirical data into account when theorising about knowledge has acquired respectability in most philosophical circles and without doubt Churchland has contributed to this. It is accepted by many that acquiring knowledge is an essentially biological phenomenon, in the straightforward sense that it is something our brains do and there is no reason to expect that brains should have evolved to have *a priori* knowledge of the true nature of things. According to Churchland the progress in empirical psychology and neuroscience has narrowed the gap between traditional philosophical questions about knowledge and empirical strategies for exploring how brains reason, perceive and think. She therefore thinks that the time is ripe for neuro-epistemology.

The mind/body question at present still is a metaphysical question, where we might define metaphysical questions that have not wholly migrated to

one of the special sciences. It is in the light of this context that we must finally judge Churchland's position in philosophy.

5.2 Alternative paths

5.2.1 *The Human Being*

The first question I asked myself before discussing my thoughts on the mind/body problem, is how do I conceptualise the different elements and categories involved? My concepts are no doubt strongly influenced by my training and work as a neurosurgeon, but also by my background and culture, religious upbringing, economic background, life circumstances, and so on. Especially the first of these is prominent in the present case.

I agree with the Dutch-Calvinist philosopher and professor of law, Prof. Kok's vision of the body as an encaptic structure, and it is seen by me that the human body is a structure that encompasses all of the various aspects of human existence. Reduced to four overarching structures we find the body to enclose:

a) a physical chemical structure;
b) a biotic vegetative structure;
c) a psychological structure (centered on sensing and feeling); and
d) the so-called act structure referring to the inner workings of the mind.

In terms of key theory, the model (40) is posited:

(40) ALL OF HUMAN EXISTENCE ? BODILY FORM
[BODILY FORM ENCLOSES THE PHYSICO CHEMICAL,. BIOTICAL, PHYSICAL, MENTAL]

The physico-chemical structure is to be found as physical and chemical actions and reactions in all parts of the body - from individual cells to the organs and to the structural entities like the skeleton. It is responsible for our structure and appearance. It is seen in the metabolism, chemical reactions and so-called biochemical reactions in the living organism. The physical and chemical elements return to "nature" when decomposition at death takes place.

The biotic-vegetative structure is concerned with the metabolism of the cell, keeping it alive and in the best possible condition. This includes:

a) vital activity of cells and activity between cells;
b) the absorption, distribution, and processing of nutrients and oxygen, and the removal of metabolites;
c) the function of the autonomic nervous system present as the sympathetic and parasympathetic systems as well as the elements of the central nervous system responsible for homeostasis. These control and influence the organ systems e.g. the heart, lungs, kidneys, glands secreting the hormones, digestive juices etc.: all concerned with the vegetative processes.

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The psychological (or better the "psychical", since we are not concerned with the structure of discipline) structure is active where the mind and brain enter the picture where unconsciously they regulate and control the activities that can be described as animated. These include:

a) the primitive nervous system not controlled by the human will, and the sensory systems needed for perceptions of external stimuli - coming from our surroundings;
b) the use of external stimuli to enable spatial orientation responsible for body position etc. (proprioception);

c) instinctive reactions to noxious and other stimulation, also described as automatic reactions;
d) body language, facial expression, blushing, turning pale and the like; and
e) control of muscle tone and muscle contraction and relaxation.

The act or mind structure has been debated from many angles in this study and does not need further clarification at this point. [1]

I have briefly delved into Dooyeweerd's model, because I think it represents a holistic anthropological model, from which first perspectives can be gleaned to develop, as part of the philosophical anthropology project, a philosophy of mind.

5.2.2 *Folk-psychology*.

Folk-psychology, considered by many as a theory (debatable), can be considered the pre-scientific, common-sense conceptual framework that all normally socialised humans deploy in order to comprehend, predict, explain and manipulate the behaviour of humans and higher animals. This framework embodies our baseline understanding of the cognitive, conative, affective and purposive nature of people. Considered as a whole, it constitutes our conception of what a person is. This description is generally accepted but it strikes one that whenever folk-psychology is discussed it is seen as something archaic and static. It is often forgotten that it is used by everyone every day to understand fellow humans and is necessary to enable us to associate, converse, etc. with others. Each of us understands others as well as we do, because we share a tacit command of an integrated body of lore concerning the law-like relations holding among external circumstances, internal states, and overt behaviour. Given its nature and functions, this body of lore may quite aptly be called "folk-psychology"

(lore is the knowledge and traditions related to, or possessed by, a particular group of people).

Folk-psychology is the way that humans in general understand and see things. It differs from group to group, from culture to culture, from religious group to group and it alters and adjusts from day to day depending on scientific advances, happenings in the world at large and in the immediate vicinity e.g. atomic research and application, space travel and research etc. Folk-psychology eventually catches up, at a certain level, with the conceptual revisions brought about by scientific advances.

We feel the need to understand and communicate with fellow humans, and as this is in fact an essential part of our make-up, folk-psychology can never be eliminated. It will change and develop uninterruptedly as the knowledge, and experience of the "folk" take place. In this connection one admits that as science progresses, beliefs contained in our folk-psychology are altered. It is my opinion that we must use our "folk" concepts, as well as reason and science to examine our assumptions and make the necessary revisions, and in such a fashion we "bootstrap" our way upwards to a better understanding of reality. I see no reason why folk-psychology assumptions cannot serve as a provisional departure point for our investigations until they need to be left behind. Questions that are considered metaphysical, where scientific and experimental approaches at present provide no answer and progress seems slow or stymied, may eventually be resolved in this fashion.

Certainly; some beliefs, understandings, conceptual frameworks, cognitive abilities and so forth will change and develop, sometimes drastically so, but I see no reason for the elimination of the folk stance as such. Folk-psychology, perhaps unrecognisably altered, will always be there. Even the

theoretic reduction of phenomena will not necessarily make it disappear. The truth that confronts us here can be depicted as below:

(41)FOLKPSYCHOLOGY

/

EVERYDAY EXPERIENCE ? {PRECEDES SCIENCE}

{GROUNDS SOCIAL RELATIONS}

5.2.3 *Consciousness*

Do we really consider a sleeping person as being unconscious? He or she is certainly not consciously aware of any perceptions at that time, but unconscious? Is this a disturbance of his or her consciousness? Our standard medical viewpoint will not consider such a person as being unconscious — merely as a sleeping person. On the other hand, a person who is disorientated, but still reacting to his or her surroundings, reacting to their perceptions, is considered in the medical world as suffering from disturbed consciousness: actually, disturbed conscious awareness. Philosophers, especially behaviourists and functionalists as well as many others, often consider a sleeping person to be unconscious, as he or she at that time is not aware of things (except if he or she is dreaming). They consider consciousness as conscious awareness, which is the closest many come to defining consciousness.

There seems to be confusion when the term consciousness is used and consciousness as such should be distinguished from conscious awareness. Key-theoretical the crucial relation is:

(42)CONSCIOUSNESS ? GROUNDS ? CONSCIOUS AWARENESS

Perhaps it would be better if the division were considered as wakefulness and conscious awareness. Wakefulness is a function of the so-called primitive brain; that is the brainstem nuclei, the thalamus, hypothalamus, cingulum etc., whilst with conscious awareness the cerebral cortex is the major role player. Conscious awareness is closely connected to knowledge. We all agree that there is no specific area where consciousness is situated, but there are certain areas like the reticular substance that are essential for it.

I have a problem with a statement Churchland periodically makes namely that a mental state can be unconscious. The word mental in my opinion is part and parcel of being consciously aware. I am of the opinion that the term should be brain state or neurological state, but not mental state. I accept that the major part of cognition is considered to take place unconsciously. It is my contention however that mental action, mental causation, and mental processing can only take place after we are aware of something. In the unconscious state the cognitive activity cannot be considered mental activity, it must be considered as neuro-physiological activity. This is often a source of confusion amongst cognitive scientists. Examples of brain-states that are unconscious and can enter consciousness at any given moment when the right stimulus to do so is present, are our beliefs, desires, memories etc. It is clear that there must be a crucial connection between the unconscious brain states and cognition and conscious mental states.

A possible field of study is the newborn where we certainly observe wakefulness, yet only a limited awareness. A newborn does react to certain stimuli, however is this reaction a reflex or some other inborn reaction type?

In medical practice the level of consciousness of a patient is monitored on the Glasgow coma scale. With this scale the reaction of a patient to certain stimuli are registered. With the Glasgow coma scale the patient's response to visual, pain and verbal stimulation is recorded and a numerical value according to response is given. This is a very useful way of monitoring the level of disturbed consciousness but does not indicate conscious awareness and every now and then a patient is considered fully conscious on the basis of the Glasgow coma scale whilst he or she has in fact no conscious awareness and afterwards no memory of events that happened at that time.

Virtually all scholars concerned with the problem of consciousness and therefore the mind underwrite the evolutionary theory of consciousness. Evolution also produces culture and society! So consciousness can also be looked at from the angle of sociologists (e.g. content of our everyday awareness). This may be a departure point from which all the paradigms can find common ground

Searle in discussing unconsciousness makes the following statement *(1998:18)*: "Most of our conscious life is unconscious. I will argue that we have no conception of an unconscious mental state except in terms derived from conscious mental states." He adds *(1998:152)* that "The notion of an unconscious state implies accessibility to consciousness." Basically this statement is irrefutable. We cannot think about, argue about or even consider anything that has not entered our consciousness. The statement however raises a serious question. Is there such a thing as an unconscious mental state? There certainly can be a brain state of which we are not conscious, but a mental state?

Different unconscious states are possible, for example:

a) where the brain does not function normally due to disturbance like injury or illness;

b) where certain brain functions like the control of blood pressure, hormone secretion etc. take place unknowingly; and
c) where an awake person does not knowingly register an event or condition, like when he drives his motor vehicle to work for example.

There is some mechanism in the brain that sorts out what is of specific interest at a given moment and allows such a perception to reach the awareness level whilst it discards other incoming stimuli. The following diagram might be helpful in this regard:

perception of inner senses	thought	perception of outside sense

Impulse

Conscious unconscious

Thought	action	thoughts that can become conscious	thoughts that remain unconsciouss	brain reacts without knowledge

It is my opinion that the moment we become aware of something it gives rise to mental activity that includes reasoning, thought, memories, behaviour, emotion, and so forth.

The Afrikaans word for consciousness is ‘bewussyn”. In analysing the word we obtain the following: “Bewus” is to “be aware of” and “syn” deals with the “being” of the inner person. The Afrikaans word immediately

includes something personal and is thus subjective. The English word, on the other hand is "conscious" which is "to be aware of", and "ness" the noun form which does not have a personal connotation. The expression is thereby more objective.

Perhaps this is one of the problems Searle refers to when he complains that the nomenclature drowns the thinking on subjects like consciousness. Another example of where different languages lay stress on different aspects of consciousness is found in the Afrikaans word: "onbewus", which means "not being aware" of, whilst in English the word "unconscious" we are faced with a linguistic problem as "unconscious" indicates a disturbance of consciousness and not only a disturbance of awareness.

Another area of possible confusion is the fact that consciousness has properties, is a faculty and is a phenomenon. Whenever consciousness is discussed it is not made clear which one of the three is addressed.

The question one must now ask is whether a person needs a fully intact functioning nervous system to be fully conscious — as a person born blind for example does not know, see or experience colour, does he have full consciousness?

A further problem with consciousness is illustrated by the following; one often drives one's motor vehicle on "autopilot", not paying much attention to the details of the road and traffic, yet reacting to them as needed. Are we conscious? Semiconscious? Certainly not unconscious! At what level of consciousness do we drive?

When reductionists discuss consciousness they fail to describe accurately what we experience. They fail to indicate whether they are discussing the properties of consciousness or the faculty of consciousness or the

phenomena of consciousness. Their agenda has been set by what they oppose - the classical dualism of Plato and Descartes. Yet both dualists and reductionists agree that there is separation between the physical neurological activity and the non-physical mental activity. In spite of phenomenal advances in neuroscience, the reductionists have thus far failed to build a bridge between them. Thoughts, phenomenologically, still seem to be like Cartesian *res cogitans* without clear location and extension in space. As our mental abilities are limited by our present understanding of spatial dimensions, I doubt if we will ever be able to build such bridges. Perhaps with the discovery and theoretical exploration of more dimensions it will become possible.

The mystery remains, in spite of all the advances in neuroscience, of how the mind functions and how it is that we become aware of the result of its activities. To summarise: only when one is conscious is mental activity and physical activity possible. When one is not fully conscious these activities are disturbed and appear abnormal.

It is generally accepted that it is impossible to define consciousness. We come close when we define it as "a brain state that enables mental and physical activity."

5.2.4 *The mind*

All our actions are accompanied by a sense of awareness and authorship. These two disappear when the mind is seen in terms of physics, neurophysiology, evolutionary development etc., and the result is a complete de-personalisation and de-socialisation of our self-understanding. The awareness of authorship implying accountability is the core of our self understanding, and it is disclosed only to the participant (while in folk-psychology terms we are used to attributing such authorship to a person).

This crucial aspect of human experience eludes scientific description, and is in fact totally ignored by Churchland.

When Churchland and others discuss mind and its functions they virtually confine themselves to the cognitive function of the mind and ignore affective and the conative functions. She and others appear to consider all mental functions to be of a cognitive nature. (I dispute this as previously indicated.) This does not make sense to me, as these ignored functions have an influence on cognitive functions like perception and reason. They also form part of our personality, our "self" and the way we react to others, the world around us and our interpersonal relationships. These functions determine the "mood" we are in, whether our approach is positive or negative to any problem or undertaking and "how we see the world and others." Perhaps the reason is that it is difficult to see how these functions can be reduced to neuro-scientific principles.

Let us therefore pay attention what these different mental functions are:

a) Cognitive function consists of conscious awareness and knowledge of objects through perception, memory and reason. This is based upon and needs the following:
   -- Intelligence
   -- A certain level of consciousness
   -- Concentration
   -- Judgement
   -- Memory
   -- Insight
   -- Reality-orientation
   -- Perception
   -- Thought-process organisation

b) Affective function includes the disposition of the person. It unlocks the spectrum of emotions that are experienced, the way emotions are handled and the effect of the emotions on other functional spheres. To summarise the function consists of:

-- the spectrum of emotions;

-- the management of emotions; and

-- the effect of emotions on one's daily functioning.

c) Conative function includes the motivation of the person and includes:

-- driving forces;

-- ideals; and

-- values etc.

When considering the mind the fact that it has all these and other characteristics is mostly forgotten. First of all, the mind "belongs" to an "I" and ignoring this fact gives rise to depersonalisation, as we see for example with Churchland.

A nagging question about the connection between cognition and the brain is: Can we ever get beyond mere *correlations* to actual identification, and hence reduction?

When we speak of the mind, we are speaking at some level of abstraction of yet unknown physical mechanisms of the brain, much as those who spoke of the valence of oxygen or the benzene ring were speaking at some level of abstraction about physical mechanisms, then unknown.

5.2.5 *Perception*

To perceive is to have a mental picture of a phenomenon or event in the world or about our body or a thought that has come up without any apparent reason. Perception is in the form of symbol or language or a combination of the two and mostly in syntactic form, though seldom in the

form of a complete sentence; this is so-called mentalese (language of thought). Where this mentalese is situated in the brain is unknown, as is the area where thoughts are situated. The problem seems to be the fact that thought is indeed not something physical. Perception of something entering the mind in the form of an impulse from a sense organ is only triggered after the impulse is modified by a large number of modifying factors present in the mind, like biological activity influenced by hormonal factors and metabolic factors, cultural background, knowledge and many more. Schematically we can present it as follows:

	Hormonal
Biological	Metabolic, etc.
	Cultural background
Evolutionary	Training
	Surroundings
	Imagination
	Knowledge
	Experience
	Morality
Mental	Economical
	Thought
	Memory
	Emotions
	Motivation

When we have perceived something and it has entered our conscious awareness we are able to analyse it and examine the different aspects of it consciously. In this process our perception may again be altered. The process involved is in my opinion much more complicated than that

described in detail by Churchland, although her theory of connectionism whereby the connection of different mental networks *communicate* indicates the same basic principle.

In the period immediately after the Renaissance it was generally accepted that the mind at birth was like a blank slate, like a blank ledger on which experience is copied and thus which forms it. This was accepted until the 1960s when Chomsky argued that in the case of the faculty of human language, there is a dimension of innateness to reckon with. He speculated that the brain is genetically programmed to contain a specific programme of an abstract system of syntactic rules that are brought to bear on incoming acoustic impulses. On the deeper level these rules are universal to human languages and specific to them. Since then innate abilities have come to be generally accepted, although today still, there are those who attack various models of innatism on various grounds. Chomsky's own student George Lakoff has moved to an experience paradigm in his metaphor theory.

The dualism debate originated with Descartes who set the mind apart from the body, and this gave rise to the materialist reductionist debate and theories up to the present time. These are still very much alive as the reductionists have not succeeded in reducing the mind to a materialist phenomenon. That there is a clear separation from the external physical world and the conscious experience thereof, is acknowledged by both the dualists and the reductionists. The major problem with reductionism is that it places not only our thoughts in the brain but also the phenomena we experience. They accept that phenomenal experiences appear to have phenomenal qualities but argue that science will eventually show that these are really states or functions of the brain. When I see something in front of me, I experience and see it in front of me and not in my head; when I experience a pain in my foot it is situated in my foot and not somewhere in my brain. Churchland, using neuroscience, places the phenomenon in my

brain as a neural and mental state and this I cannot accept. How can things described so differently be the same?

Due to developments in science the metaphysical questions of former days have diminished. Of the remaining metaphysical questions, most are about the mind. Churchland *(2002:42)* asks "What is the nature of consciousness, the self, free will? Is the non-physical mind perhaps the fundamental reality, the only fundamental reality? How can we understand the mind when we have to use it to understand it?"

There is a mind/body problem only if the mind is non-physical and the body is physical. The nub of the problem is how the two substances can interact and have effects on one another if they share no properties whatsoever. How, for example (to quote Churchland, *2002:43)*: "Can mental decisions have an effect on neurons, or how can directly stimulating the cortex with an electrode result in feeling one's leg being touched? On the other hand if the mind is activity of the brain, then that particular problem at least, does not exist."

5.2.6 *Language:*

Ray Jackendoff *(1999:4-14)* explains how incoming impulses to the brain from different receptors give rise to representations which are expressed in different mental languages; and that there is more than one language of thought. He lists as each having its own language of thought the following:

a) The language faculty
b) The Visual faculty
c) The Musical faculty.

He argues that there must be interaction between them and I agree that this is mostly of a formal language nature. I favour "mentalese" for these different languages as this includes symbols as well as language as we

understand it. We think mostly in mentalese and express ourselves in language. We thus find that the different mental languages, when we give expression to our perceptions, unite in formal language. In this unification process however the qaulia of the representation is often lost in our inability to express it in formal language.

The different mentalese languages are obviously connected to the cortical areas of the brain involved in perceiving different inputs and will therefore be in agreement with the "Baars theory" of a global workspace but we must consider formal language as a possible place where things do come together. There is general agreement amongst philosophers that there is no known point or place in the nervous system where everything comes together. There is talk of a Cartesian Theatre, Global Workspace, etc. but due to the fact that somehow everything we register is in the form of mental language, to me the question has now arisen as to whether this is not the point where everything comes together. Formal language can thus be considered a unifying factor.

Language is used to communicate - who does one communicate with when using mentalese? Is it not perhaps with a homunculus? More probable is that one communicates with oneself. This gives rise to the thought that the self is divided in a subject self and an object self. Is this a form of dualism?

A problem I experience is to explain the brain activity involved in conversation, as talking and exchanging ideas is done without planning in any detail what we are going to say or answer; often it seems to be nearly reflexive. We only occasionally plan which words we are going to usefor example. This part of speech activity takes place unconsciously and when we examine it, it is baffling. Somewhere in the brain there is a mechanism that allows us to immediately understand and interpret what is being said

and to respond to it sensibly, in language, immediately. The speed at which this happens is astounding and it is one aspect that does not receive the neuro-scientific attention it warrants from Patricia Churchland. What is more is the fact that it is associated with facial expression and body language. All this must be unconscious cognitive activity associated with afferent and conative activity. To a lesser extent writing often follows the same pattern. Considering this activity without the affective and conative responses, depersonalises and dehumanises it.

.What is just as baffling is that we reason in language but human beings are, for the most part not, in control of, or even consciously aware of, their reasoning. The power of abstract thinking made possible to us by language enables us to conceptualise and cope with all those aspects of reality which are not represented to us, and thus relate ourselves to the world in the way we do. Many believe that it is this more than anything else that differentiates us from the animals. It is also through the acquisition of language that we can think of ourselves as something with a self.

5.2.7 *Cognition*:

Cognitive function includes perception, intelligence, concentration, memory, judgement, insight, attention, thought processing, organisation etc. It allows us to perceive, experience, recognise, learn, remember, plan, solve problems, judge, think, understand, etc.

Stimulation of the cerebral cortex can be used to localise the primary sensory and motor areas in the brain but cannot be used to investigate complex cognitive functions. It follows that there is no reason to assume that all functional systems lie in discrete anatomical areas. This is difficult to explain as there is no doubt that the cerebral cortex must be involved in cognitive function. Cortical stimulation is also of no help in investigating the conative and afferent mental functions. It does indicate however that

these functions probably incorporate several subsystems or modules of mental functions. Disruption of these "modules" often results in the emergence of lower level activity in perception or action, e.g. perseveration (repetition of action) or inability to initiate or terminate behaviour and action.

Often we do find that a certain aspect of mental function is impaired in a patient whilst others are preserved. This does suggest that separate modules are used in processing. Investigating cognitive function with this approach has produced methods for determining impaired function not linked to specific brain areas but instead to components of cognitive function and abilities present in the brain. In the course of my study I could not reach any definite conclusion about Churchland's (possible) perspective on these developments.

It is my opinion that cognitive processing takes place in stages, that at each stage several neurons (systems) are activated and "information" is developed in this way. Stages can be active at the same time in parallel and that in this way it is possible for a perceptive impulse to be influenced by our experience, culture, environment, economic circumstance, intelligence, belief, morality etc. All of this can occur before it becomes a perception or idea of which we become aware.

5.2.8 *The brain*

The concept of the brain as it features in Churchland's writings needs some qualification. The sensory organs distributed through the body, from organs for touch to vision, are sensation-specific; when a stimulus reaches the brain it is already sensation-specific and the central nervous system, the brain, only has to quantify the sensation, interpret it and make it available to consciousness. It does not determine whether it is a touch or pain or a vision stimulus that has reached the central nervous system — that has

already been done at the periphery. I therefore feel that the term "brain" should be replaced by "nervous system" at least when we are dealing with sensory perception. It is also an interesting fact that pain, or touch or whatever sensation is registered, it is felt in the vicinity from where it originates and not in the brain. In my case, these facts seem to strengthen the argument that Churchland does not refer to, or attempt to explain, these important findings. It strengthens the argument that the brain and the nervous system as a whole, are integral parts of the body.

5.2.9 *Causation*

Questions that are uppermost in my thoughts when dealing with neuroscience and the mind/body problem are:

1) How can neuroscience get beyond mere correlations of events as the cause of events?
2) What are the neurological mechanisms whereby an organism, including us humans, acquires a systematic causal map of the environment it inhabits? This is a puzzling matter because background knowledge is essential to distinguish mere correlations from causal connections. In other words how in fact does the nervous system deploy relevant background knowledge together with current observations, manipulations, and interventions, to achieve a predictively powerful causal mapping of its world? Is this perhaps an innate ability? We infer causation from certain patterns of regularity observed in the following:
   a) A given event can have multiple causes.
   b) Events may be independent but have a common cause.
   c) Statistical analyses are essential in cases where we are trying to identify causally relevant factors.
   d) Certain sampling techniques help eliminate confounding findings.

My as yet unanswered question is: Are these issues being addressed in neurophilosophy? [2]

5.2.10 *Connectionism*

Patricia Churchland supports connectionism (see p. 20 for connectionism). Connectionism in the philosophical world can be considered to be in the socio-cultural sphere of ideas or in the sphere of philosophical ideology. In the sphere of ideology it can be considered to be one of a group including positivism, Platonism, idealism etc. and like all others it is built around a key formula and it makes use of metaphors. Analysing connectionism as philosophical ideology we find the key formula:

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The use of units and weights as done by Churchland is metaphorically important in the technical modelling. Connectionism can also be considered an ideological philosophical movement in the socio-cultural sphere and may be compared to social movements in the socio-cultural sphere of ideology, feminism, new age, gay rights movement and so forth. While here it contains elements of various aspects of individuality it reverses the above.

5.3 *Final remarks*

I guess that at the end of my study, I have to ask again the classic questions that so many others are asking: What is the real nature of mental states and processes? In what medium do they take place and how are they related to the physical world? Is it possible that a purely physical system such as a computer could be constructed so as to enjoy real conscious intelligence? Where do minds come from? What is a mind?

When these questions are finally answered we shall perhaps be rid of certain aspects of mind that are mysteries at the moment e.g. sentience, the self, free will, meaning, knowledge, morality, spirituality, etc. Although some mysteries in science have been upgraded to problems, in the case of the above-mentioned this does not seem to be the case to me.

The ultimate question remains: how does the physical activity of the brain become non-physical activity like thought, language etc? Perhaps we will never be able to answer this question for the reasons given by Colin McGinn. Perhaps it will one day be answered when we discover and understand other dimensions left over after the "big bang".

Notes:

[1] Dooyeweerd, from a religious point of view, relates this whole bodily structure to a transcendent self. As I do not share his convictions in this regard, I will refrain from discussing this part of his theory. My own feeling is that even if one does not share the religious paradigm, Dooyeweerd's model still offers an intriguing attempt at a holistic approach, where both the uniqueness and the constitutive structures are fully honoured.

[2] One must be careful not to ascribe cause to events that seem to run parallel to each other.

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APPENDIX

For the appendix I have made use of what can be found on the Internet as well as other sources.

Selected Works

Books by Patricia Churchland

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Summary:

Patricia Churchland is a professor at the University of California and is a philosopher and cognitive scientist with special knowledge of the neurosciences. Neuroscience in her opinion is relevant to solving the problems posed by philosophy in the field of the mind/body problem. This has given rise to the creation of neurophilosophy, a new sub-discipline in philosophy. Patricia Churchland has a fixed direction in her agenda that is directed at proving that the mind is nothing but neurological activity. Neuroscience in her opinion will in the long run solve the mind/body problem and at the same time eliminate folk psychology. The basic theme in her thought is that there is no non-physical mind but that mind must be explained on the basis of physical activity. She employs the notion of neural activity as foundational to the mental activity of the brain that is then responsible for the mind. The problem of how neurological activity can give rise to the non-physical mind (thought, reason, and so forth) remains however unanswered.

Although her work has caused widespread commentary, critical evaluation on deeper levels has not received the attention it warrants. The following study is an attempt in this regard. For this purpose I have used the following philosophical tools: ideology analysis, metaphor analysis and analysis of "key formulas" (logosemantic analysis). The result of this analysis points to a one-sidedness in Patricia Churchland's approach to the mind/body problem, while neuroscience and eliminative materialism is pushed to its limits.

In this study the abovementioned tool-analysed results have also been compared to the views of other well-known thinkers in the field. Lastly I have included some of my own ideas on future prospects for research on mind and consciousness.

Key terms: mind, brain, neurons, consciousness, neuroscience, neurophilosophy, logosemantics, ideology analysis, metaphor analysis, eliminative materialism, folk-psychology.

Opsomming:

Patricia Churchland is tans professor aan die Universiteit van California en is ‘n filosoof en kognitiewe wetenskaplike met spesiale kennis van die neurowetenskap. Neurowetenskap, in haar opinie is onontbeerlik vir ‘n oplossing van die probleme gestel deur filosofie in die veld van die gees/liggaam problematiek. Dit het aanleiding gegee tot die ontstaan van neurofilosofie, ‘n nuwe sub-dissipline in filosofie. Patricia Churchland het ‘n fikseerde navorsing agenda gerig daarop om te bewys dat die mens se gees niks anders is as neurologiese aktiwiteit. Neurowetenskap sal in haar opinie die gees/liggaam probleem oplos en tegelykertyd volks – psigologie elimineer. Die basiese tema in haar gedagtegang is dat daar nie so iets bestaan as ‘n nie-fisiese gees, maar dat gees verduidelik moet word op die basis van fisiese aktiwiteit. Sy gebruik die idée van neurale aktiwiteit as fundamenteel vir geestesaktiwiteit van die brein. Die vraag van hoe neurologiese aktiwiteit aanleiding kan gee aan nie-fisiese gees (gedagtes, redenasie en so meer) bly egter onbeantwoord.

Alhoewel haar werk wydverspreide belangstelling en kritiek uitgelok het, het kritiese evaluasie op dieper vlakke nie die nodige aandag gekry wat dit verdien nie. Die volgende studie is ‘n poging daartoe.Vir hierdie doel het ek die volgende filosofiese gereedskap gebruik: ideologie analise, metafoor analise, en analise van “sleutel formules” (logosemantiese analiese). Die resultaat van die analise dui op ‘n eensydigheid van Patricia Churchland se benadering tot die gees/liggaam probleem, waarby neurowetenskap en elimineerende materialisme na hulle uiterstes gedryf word.

In hierdie studie word die bogenoemde filosofiese gereedskap ook gebruik om die werk van ander bekende denkers in die veld te analiseer, en te vergelyk met Patricia Churchland se werk. Aan die einde van die studie het ek ook sommige van my eie idees ingesluit om rigting te gee aan moontlike toekomstge navorsing op hierdie gebied.

Sleutel woorde: geestesfunksies, brein, neurone, bewussyn, neurowetenskap, neurofilosofie, Logosemantiek, ideologie analise, metafoor analise, elimineerende materialisme, volks-psigologie.