
UNIT 1 DEFINITION, SCOPE AND IMPORTANCE

Contents

- 1.0 Objectives
- 1.1 Introduction
- 1.2 Basic Questions
- 1.3 Theories of the Mind and Body
- 1.4 Some Significant Themes
- 1.5 The Basic Philosophy: Materialism?
- 1.6 Importance and Scope of Philosophy of Mind
- 1.7 Let Us Sum Up
- 1.8 Key Words
- 1.9 Further Readings and References

1.0 OBJECTIVES

- To introduce the students to the basic notions of philosophy of the mind.
- To set the stage with the basic notions of this discipline so that the students can gain further information on philosophy of the mind.
- To take up some core themes and issues of philosophy of the mind..

1.1 INTRODUCTION

The philosophy of mind is the branch of philosophy that studies the nature of human mind or, in other words, what it is that makes us conscious beings. The central question in the field is whether the mind is material or immaterial: Are we merely physical beings, or something more? Do we have immaterial souls that animate our bodies, or are we merely electrical activity in an organic brain?

1.2 BASIC ISSUES

The philosophy of mind is concerned with the problems associated with the functioning of the mind or brain. It tries to study the properties of the mind and its relationship with body. Such problems can take on many different aspects, for instance:

- Is the mind separate from the brain, or a by-product of it?
- Is there such a thing as a permanent self or soul?
- What is consciousness?
- Is artificial intelligence possible?

As an introduction, we can say that Philosophy of mind is a branch of philosophy that studies “the nature of the mind, mental events, mental functions, mental properties, consciousness and their relationship to the physical body, particularly the brain.” The mind-body problem, i.e., the

relationship of the mind to the body, is commonly seen as the central issue in philosophy of mind. At the same time there are other issues concerning the nature of the mind that do not involve its relation to the physical body that is studied in this course (PoM 2011).

1.3 THEORIES OF THE MIND AND BODY

In this section, we take up the issue of mind and body and give some introductory concepts that are crucial for our further reflection. In fact, Dualism and monism are the two major schools of thought that attempt to study the relationship between mind and body, which we will briefly treat here. We will also study some other related theories too.

Dualism

Dualism can be traced back to Plato, Aristotle and the Sankhya and Yoga schools of Hindu philosophy, but it was most precisely formulated by René Descartes in the 17th century. Dualism may be further classified into Substance Dualism and Property Dualism. Substance Dualists argue that the mind is an independently existing substance, whereas Property Dualists maintain that the mind is a group of independent properties that emerge from and cannot be reduced to the brain, but that it is not a distinct substance (PoM 2011). The dualist viewpoint divides the human being into two basic or primary substances: matter and mind. This view is, perhaps, the most natural one.

The main reasons for this are:

- It is suggested by our day-to-day experiences. It is quite common to distinguish between “my body” and “my self”, and our bodies may become injured or ill whilst our minds are active and alert. Our mental experience is also private, reinforcing the feeling that it is somehow separate.
- Strong traditional backing or the long history for such a position. Views that spring from folklore, native belief and religion can all influence our views of our self. This is sometimes done consciously – as in the religious doctrine of immortality – or subtly, through language and the way in which we refer to ourselves.

In general dualism may be further divided into two: Substance dualism and Property dualism. Substance dualism is well-established among non-philosophers and holds the view that there are two fundamentally different types of substance--physical and non-physical--and that human beings are made up of two components: physical bodies and non-physical minds. This theory has many attractions, but is now seen by many, rightly or wrongly, as old-fashioned and naïve. Property Dualism is in fact substance monist; it agrees with materialism that there are only physical substances. However, it concedes to the dualist that these substances have both physical and non-physical properties, and that the non-physical properties cannot be fully explained in purely physical terms. Although this position is intended to capture the best elements of both positions, it arguably ends up with the liabilities of both as well (PoM 2011).

As we can imagine, dualism - although, some would argue, the most common sense view - gives rise to all sorts of problems. If mind and body are separate substances, how do they interact? If mental stuff is immaterial - and therefore without quantity, weight, size, etc. - how do we know it exists? As a response to these problems, certain philosophers have argued that dualist account of

mind is unnecessarily complicated and that the problems it presents can be solved by adopting other views.

Monism

As opposed to Dualism, Monism is the position that mind and body are not ontologically distinct kinds of entities. This view was first advocated in Western philosophy by Parmenides in the 5th century BC and was later explored by the 17th century rationalist Baruch Spinoza. Monists may be further classified as follows (PoM 2011):

Physicalists argue that only the entities postulated by physical theory exist, and that the mind will eventually be explained in terms of these entities as physical theory continues to evolve. Idealists, unlike the physicalists, maintain that the mind is all that exists and that the external world is either mental itself, or an illusion created by the mind. Neutral monists adhere to the position that there is some other, neutral substance, and that both matter and mind are properties of this unknown substance. In opposition to substance dualism there is substance monism. It is the view that there is no distinction between the mental and physical realms, that everything is fundamentally the same. Although it is possible to argue that everything is mental, as idealism does, it is much more common to hold that everything is physical, to endorse “physicalism” or “materialism” (PoM 2011).

Most modern philosophers of mind adopt either a reductive or non-reductive physicalist position, maintaining in their different ways that the mind is not something separate from the body. These approaches have been particularly influential in the sciences, especially in the fields of sociobiology, computer science, evolutionary psychology and the various neurosciences. Reductive physicalists assert that all mental states and properties will eventually be explained by scientific accounts of physiological processes and states. Non-reductive physicalists argue that although the brain is all there is to the mind, the predicates and vocabulary used in mental descriptions and explanations are indispensable, and cannot be reduced to the language and lower-level explanations of physical science. Continued neuro-scientific progress has helped to clarify some of these issues. However, they are far from having been resolved, and modern philosophy of mind continues to ask how the subjective qualities and the intentionality (aboutness) of mental states and properties can be explained in naturalistic terms (PoM 2011).

Other philosophers, however, adopt a non-physicalist position which challenges the notion that the mind is a purely physical construct. Besides the two general schools discussed above, there are also other related ones as given below.

Behaviourism

The philosophical theory of behaviourism - or, to give its full title, logical behaviourism - holds that being in a mental state (such as being happy) is the same as being in a physical state. In other words, since all that we can know about another person's state of mind is through their behaviour, there is nothing else. Logical behaviourists believe that any statement about the internal or private world of individuals may be translated into a statement about publicly observable actions. For instance, if I say, "I am happy", this may be translated into a description of my physical state - increased heart rate, smiling, etc. If none of these things were present - the behaviourist would argue - then the person is not really happy. Obviously, emotions are not

always accompanied by extravagant outward signs, but even quieter forms of emotional or mental state must be translatable into some form of physical condition.

Functionalism

It is currently the most popular theory of mind. This is mostly due to the influence of computers on modern society - both in scientific terms and in the popular imagination through films, books, etc. As a result, most people presented with the functionalist perspective - though they would probably not know it by that term - would accept it common sense (PO 2011).

But what exactly is the functionalist perspective? Functionalism tries to move beyond Behaviourism. Functionalism is generally taken to be a materialist theory with the following characteristics:

1. Brain states are not mental states. Identity Theory supposes that brain states are identical to mental states. However, there are problems with this. If I say, "I am in pain" it is not the same as saying, "The C-fibres in my brain are firing". But, if mental states and brain states are identical, shouldn't these two statements mean the same thing? If not, and certain types of neurological process cannot be matched up with certain types of mental state, then something over and above simple physical processes must be taking place.

2. Behaviourism cannot account for mental states. Behaviourism attempts to account for the mind in terms of actual or possibly observable behaviour. However, the problem with this view is that:

a) Different behaviours can result from the same stimulus. Imagine that you hear the doorbell - how do you react? Perhaps you run to answer it because you are expecting an important visitor; perhaps you ignore it; etc. In other words, there is no one response that can be linked to the same stimulus. So, if this is the case, what causes us to behave differently? The non-behaviourist would answer that it is our beliefs. However, this is a problem for the behaviourist in that it presupposes something that cannot be explained simply in terms of actual or possible behaviour (PO 2011).

b) Different stimuli can produce the same response. As with the previous example, it is also difficult to say that there is a definite relationship between a certain type of stimulus and a certain response. For example, someone might laugh at someone falling over, seeing a photograph or from hearing a story - whilst someone else might not laugh at any of those things. In other words, there is no certain, one-to-one relationship between a stimulus and a response. If this is so, must we again say that beliefs are responsible for this?

Check Your Progress I

Note: Use the space provided for your answers.

1) What is philosophy of mind?

.....

2) Give your comments on property dualism.

.....

1.4 SOME SIGNIFICANT THEMES

After having briefly seen the relationship between mind and body as expressed through various theories, we shall take up some of the main issues in Philosophy of Mind. They necessarily form part of any serious philosophical discussion on mind and knowledge of them will initiate us better into philosophy of mind.

Personal Identity

Theories of personal identity attempt to explain what makes a person the same person over time. What is it that ensures that I am the same person now as I was many years ago? The two main approaches to personal identity propose criteria based on bodily continuity and on psychological continuity respectively. What makes a person the same person over time is thus taken to be the fact their body, or their mind, persists through time (PMInfo 2011). An alternative view, however, denies that there is a self that exists over time. Bundle theory holds that we are nothing more than a collection of mental states example, that there is no self over and above these mental states that possesses them.

Bodily Continuity

What makes my pen the same pen as it was yesterday? There are other, qualitatively identical pen, that are not my pen, so it cannot be anything to do with the qualities that it possesses. Plausibly, what makes my pen my pen is that it is possible to trace a line through space following its location from one time to the other, that there is no discontinuity in its physical location (PMInfo 2011). The bodily continuity criterion for personal identity suggests that we apply this approach to personal identity. What makes me the same person as I was ten years ago, then, on this approach, is that it is possible to trace a line through space following the location of my body.

Mind-Body Interaction

The problem of mind-body interaction is a problem faced by adherents of substance dualism. If, as dualists claim, the mind and the body are two distinct substances, then the question arises as to how the two interact. Answering this difficult question is the problem. It appears both that mental events cause physical events and that physical events cause mental events. My beliefs and desires, for example, which are mental states, cause me to act in certain ways. Similarly, what happens to my physical body often has an effect on how I think and feel. This common sense view is called interactionism.

Problems with interactionism have led some to resort to epiphenomenalism. Epiphenomenalism holds that mind-body interaction only occurs in one direction: from the physical to the mental. According to epiphenomenalists, physical events give rise to mental events, but not the other way around (Crane & Patterson 2000). Epiphenomenalism may avoid some of the problems of dualism, but it does not avoid all of them. To avoid all of the problems, it seems, one must take a further step and endorse parallelism, denying that the mind and the body interact at all. The cost of parallelism, though, is arguably too high for the benefits that it offers. Interactionism, despite its difficulties, is the most plausible theory of mind-body interaction available to the dualist (PMInfo 2011).

The Problem of Other Minds

Why should other minds be a problem? Well, though the problem has many aspects it mainly concerns the difficulties that arise when we consider the experiences of other people. I may say that I know my own mind better than anyone else – or at least I am in the best position to. I have what is philosophically called “privileged access”. All this means is that I have a unique relationship to the contents of my own mind and mental experience, a form of access that no one else can have (unless, possibly, they are telepathic...). This is fine, so far. But the problem arises when I try to imagine what it is like to be someone else. The recent film, *Being John Malkovich* (PMInfo 2011), imagined that it was possible to enter the mind of another person, to see through their eyes, feel their emotions, etc. However, in real life, it is not possible to do this, so how can we really know that other people experience the world in the same way?

Another, more radical aspect of the problem concerns the existence of minds in other people at all. This sceptical problem argues that not only is it impossible to know what another person is thinking/feeling, but also that they actually think and feel. Although few people actually intend this argument to be taken seriously – along the lines of a Hollywood horror film – it does raise important points: what do we base our knowledge of other people on? On what basis do we interpret their actions? How can we claim knowledge of what others think and feel? (Gertler & Shapiro 2007).

1.5 THE BASIC PHILOSOPHY: MATERIALISM?

The theory of choice for many scientists of philosophy of mind is materialism, which denies the existence of strange, non-physical substances and insists that we are entirely physical beings. Materialist theories attempt to reduce mentality to physicality, analysing mental states in terms of physical states.

In the simplest terms, materialism is the theory that a man consists solely of organized matter- there is nothing nonmaterial constituting a part of him. Stated in these terms, behaviorism is a form of materialism, for the behaviorist thinks that a man is just a body which operates- in a very sophisticated manner. However, the behaviorist does not hold to what would generally be described as a materialist theory of mind. He does not, that is, think that minds are physical objects, for he does not think that they are objects at all (Robinson 1976).

This is the point that Gilbert Ryle emphasised in his *The Concept of Mind*. He thinks that regarding mind as a substance is a category mistake. The behaviorist does not regard minds as objects; for him, to say that something has a mind is simply to say that it behaves in a certain way. Those who hold a materialist theory of mind agree with the dualistic position against Ryle that the mind is an object, but they think it is a physical object-usually part of the central nervous system. Materialism can be stated in terms of substances or in terms of properties. It might be said that man is no more than a physical object or it might be said that he possesses only physical properties, where “physical property” is taken as including what would be so called according to common sense and those properties that figure in the basic natural sciences—that is, physics and chemistry. In saying this we do not exclude emergent laws or concepts which describe the overall properties of the aggregate (Robinson 1976).

Today there are many other philosophers of mind, who are not materialists in the crude form. According to them we can very well have a non-dualistic philosophy of the mind, that does not reduce everything to its physical or material aspects.

Check Your Progress II

Note: Use the space provided for your answers.

1) What is the problem of Other Minds?

.....

2) Is materialism a pre-requisite for philosophy of mind?

.....

1.6 IMPORTANCE AND SCOPE OF PHILOSOPHY OF MIND

Within philosophy, the philosophy of mind is easily the most active sub-discipline today. It is virtually impossible to pick up any mainstream philosophy journal without finding one or more article on some topic in philosophy of mind. Its importance can be seen from the fact that it is not just one of the youngest of the new disciplines in philosophy, but is the most scientifically advanced and multi-disciplinary.

Scientific basis

This discipline takes into account the latest findings of recent scientific disciplines like neuroscience, artificial intelligence, anthropology, sociobiology, etc. (See the next unit for more information). It is therefore constantly evolving in pace with the latest scientific findings.

Multi-disciplinary approach

The discipline of philosophy of mind is truly a multi-disciplinary one. Taking data from various other fields of science, philosophers reflect on the significance of mind and its unique role in shaping human life and destiny.

Philosophical Anthropology and Philosophy of Mind

We may agree with the philosopher Paul Ricoeur that “every understanding is self-understanding.” He was referring to human quest for knowledge and understanding. Every time a human person acquires more knowledge and understands something deeper, one is also improving one’s own self-understanding. In this sense understanding others (persons and things) add to one’s own self-understanding. Seen thus, everything we study, particularly in philosophy, contributes to my self-understanding. Seen from this perspective, the whole philosophy is an attempt to answer the basic philosophical question: “Who am I”? In this sense we can claim that philosophy is basically anthropology. And philosophy of mind is the equivalent of philosophical anthropology in the continental traditions. Thus the scope of Philosophy of Mind may be regarded as that of Philosophical Anthropology itself.

Significance of Philosophy to solve our problems

Considering philosophy — for some the “royal discipline” per se — we can claim that she has forcefully regarded the problems that humanity has been facing. But, she has given her resources first and foremost to ethical considerations. Because of this an ethics has — admittedly not undisputed — developed as a new special ethics. But philosophy has a larger role to play in solving humanity’s problems, than ethics (Lowe 2000).

One has to agree that today, unfortunately, philosophical anthropology has lost much of her charisma, especially in the analytical philosophy or in the Anglo-Saxon world. It is particularly this deficient situation we need to consider. Then we can see the role of philosophical anthropology in particular and philosophy in general, in dealing with the many problems we face. For this philosophical anthropology has to give up her trait as an indifferent observer by concentrating on her own qualities and, above all, by trying to prepare the ground for a meaningful, critical and creative anthropology (as one of other anthropological special disciplines) who could work closely together with a philosophy of technique. Of course, it is not simple to achieve this. The first significant condition is that philosophical anthropology has to defend herself against the accusation of being an accomplice of “anthropocentrism” because the last named can be unanimously regarded as one of the responsables for environmental disasters. The second is that she has to demonstrate her inherent capacity on enlightening reflections and interpretations on the problems faced by humanity. We need to move away from “anthropocentrism” that was characterise of earlier thinking and embrace a “cosmocentrism” keeping in mind the needs of our present world. That is why philosopher Hans Jonas speaks of a principle of responsibility in dealing with our contemporary situation (Jonas, Böhler, & Hoppe 1994). He adds: “We existentially need the threat by such a concept of man that will frighten and by being frightened we must find out the true concept of man”.

In this process, our self- understanding or our “concept of man” is crucial in dealing with the threats humanity faces today. So we need to evolve constructive concepts of man in order to help ourselves. Philosophy of mind, though separate from and related to philosophical anthropology,

gives new terms and categories to philosopher to analyse the problems and offer solutions. It gives more precise definitions to philosophical anthropology and is based on current scientific findings. Thus Philosophy of Mind can truly help us realise our own uniqueness thus serve us in making our lives better.

Check Your Progress III

Note: Use the space provided for your answers.

1) How is the philosophy of mind related to philosophical anthropology of continental tradition?

.....

2) How can Philosophy of mind help us in solving our problems?

.....

1.7 LET US SUM UP

In this unit we saw the basic introduction to the philosophy of mind. We first took up some basic issues like dualism and monism that describes mind's relation to the body. Then we took up some significant themes. Then we concluded with the importance and scope of philosophy of mind.

1.8 KEYWORDS

Epiphenomenalism: It holds that mind-body interaction only occurs in one direction: from the physical to the mental. According to epiphenomenalists, physical events give rise to mental events, but not the other way around.

Anthropocentrism: It is the philosophical mistake of regarding humans as the central element of the universe.

1.9 FURTHER READINGS AND REFERENCES

Anderson, AR. *Minds and Machines*. Englewood Cliffs, N.J: Prentice-Hall, 1964.

Chennakesavan, S. *Concept of Mind in Indian Philosophy*. Columbia, Mo: South Asia Books, 1980.

Crane T, Patterson S. *History of the Mind-Body Problem*. London: Routledge, 2000.

Gertler B, Shapiro LA. *Arguing About the Mind*. New York: Routledge, 2007.

- Jonas H, Böhler D, Hoppe I. *Ethik Für Die Zukunft : Im Diskurs Mit Hans Jonas*. München: C.H. Beck, 1994.
- Lowe, E.J. *An Introduction to the Philosophy of Mind*. Cambridge: Cambridge University Press, 2000.
- Meinberg, E. *Environmental Destruction: A Philosophical-Anthropological Perspective* Paedia, <http://www.bu.edu/wcp/Papers/Anth/AnthMein.htm>
- PMInfo (Philosophy of Mind Information) (2011) “Personal Identity, Bodily continuity, Philosophy of mind,” <http://www.philosophyofmind.info/>
- PO (Philosophy Online) (2011) “Philosophy of Mind: Introduction,” http://www.philosophyonline.co.uk/pom/pom_behaviourism_introduction.htm
- PoM (Philosophy of mind). (2011, May 13). In Wikipedia, The Free Encyclopedia. Retrieved 03:20, May 17, 2011, from http://en.wikipedia.org/w/index.php?title=Philosophy_of_mind&oldid=428916752
- Robinson ,H.M.(1976) “The Mind-Body Problem in Contemporary Philosophy” *Zygon*, vol. 11, no. 4 (December 1976).

UNIT 2 PHILOSOPHY OF MIND AND OTHER DISCIPLINES

Contents

- 2.0 Objectives
- 2.1 Introduction
- 2.2 Philosophy of Mind and Other Sciences
- 2.3 Philosophy of Mind and The Continental Tradition
- 2.4 Philosophy of Mind and Buddhism
- 2.5 Philosophy of Mind and General Philosophy
- 2.6 Let Us Sum Up
- 2.7 Key Words
- 2.8 Further Readings and References

2.0 OBJECTIVES

- To enable the students to see the relationship between philosophy of mind and other philosophical and scientific disciplines.
- To familiarize with some key terms and notions of General Philosophy which are useful to philosophy of mind.
- To realize the multi-disciplinary nature of philosophy of mind.

2.1 INTRODUCTION

Humans are corporeal beings and, as such, they are subject to examination and description by the natural sciences. Since mental processes are intimately related to bodily processes, the descriptions that the natural sciences furnish of human beings play an important role in the philosophy of mind. There are many scientific disciplines that study processes related to the mental. The list of such sciences includes: Psychology, biology, computer science, cognitive science, cybernetics, linguistics, medicine, pharmacology (Leudar 2009). So in this unit we first deal with some other disciplines that are directly connected to philosophy of mind. Then we take up some crucial notions from General Philosophy that are central to philosophy of mind.

2.2 PHILOSOPHY OF MIND AND OTHER SCIENCES

Here we will focus on few sciences that directly affect Philosophy of Mind.

Psychology

Psychology is the science that investigates mental states directly. It uses generally empirical methods to investigate concrete mental states like joy, fear or obsessions. Psychology investigates the laws that bind these mental states to each other or with inputs and outputs to the human organism (Christensen & Turner 1993).

An example of this is the psychology of perception. Scientists working in this field have discovered general principles of the perception of forms. A law of the psychology of forms says that objects that move in the same direction are perceived as related to each other. This law

describes a relation between visual input and mental perceptual states. However, it does not suggest anything about the nature of perceptual states. The laws discovered by psychology are compatible with all the answers to the mind-body problem already described (PoM 2011).

Behaviorism

Behaviorism dominated philosophy of mind for much of the 20th century, especially the first half. In psychology, behaviorism developed as a reaction to those who speak about the inner workings of the human spirit. Their inner reports on one's own interior mental life are not subject to careful examination for accuracy and cannot be used to form predictive generalizations. Without generalizability and the possibility of third-person examination, the behaviorists argued, psychology cannot be scientific. The way out, therefore, was to eliminate the idea of an interior mental life (and hence an ontologically independent mind) altogether and focus instead on the description of observable behavior. (PoM 2011).

Parallel to these developments in psychology, a philosophical behaviorism was developed. This is characterized by a strong verificationism, which generally considers unverifiable statements about interior mental life senseless. For the behaviorist, mental states are not interior states on which one can make introspective reports. They are just descriptions of behavior or dispositions to behave in certain ways, made by third parties to explain and predict others' behavior.

Philosophical behaviorism, of Ludwig Wittgenstein, has fallen out of favor since the latter half of the 20th century, coinciding with the rise of cognitivism. Cognitivists reject behaviorism due to several perceived problems. For example, behaviorism could be said to be counter-intuitive when it maintains that someone is talking about behavior in the event that a person is experiencing a painful headache.

Neurobiology

Philosophy of mind draws heavily from neurobiology. The theoretical background of neurobiology, as is the case with modern natural sciences in general, is fundamentally materialistic. The objects of study are, in the first place, physical processes, which are considered to be the foundations of mental activity and behavior. The increasing success of biology in the explanation of mental phenomena can be seen by the absence of any empirical refutation of its fundamental presupposition: "there can be no change in the mental states of a person without a change in brain states." (PoM 2011).

Within the field of neurobiology, there are many sub disciplines which are concerned with the relations between mental and physical states and processes: Sensory neurophysiology investigates the relation between the processes of perception and stimulation. Cognitive neuroscience studies the correlations between mental processes and neural processes. Neuropsychology describes the dependence of mental faculties on specific anatomical regions of the brain. Lastly, evolutionary biology studies the origins and development of the human nervous system and, in as much as this is the basis of the mind, also describes the ontogenetic and phylogenetic development of mental phenomena beginning from their most primitive stages.

The methodological breakthroughs of the neurosciences, in particular the introduction of high-tech neuroimaging procedures, has propelled scientists toward the elaboration of increasingly

ambitious research programs: one of the main goals is to describe and comprehend the neural processes which correspond to mental functions. Since the 1980s, sophisticated neuroimaging procedures, such as fMRI have furnished increasing knowledge about the workings of the human brain, shedding light on many ancient philosophical problems (PoM 2011).

Several groups are inspired by these advances. New approaches to this question are being pursued to advance these issues. Some philosophers of mind once thought that the best answer to the question “What is the mind?” is simply “The mind is the nervous system”. In defending this claim, these philosophers sometimes make an analogy between prescientific attempts to answer the question “What is lightning?” and the question of “What is the mind?” Long ago, our ancestors answered the lightning question by saying it was a manifestation of a god’s wrath or something. Modern science tells us, however, that lightning is some kind of electrical discharge. And our ancestors used to answer the question “What is the mind” by saying that the mind was the soul, or some thinking substance detached from the body and brain. So in the same way the identity theorists want to claim that, just as with lightning, the modern scientific answer to the question “What is the mind?” is simply “the nervous system”. What else could it be? (Williams 2011)

One response to this argument is the idea that the mind is not identical with the nervous system, but rather, with the functioning of the nervous system. This response is designed to answer questions of biological chauvinism e.g. If some entity does not have a human nervous system yet demonstrates intelligent behavior are we to say that it does not have a mind simply because it doesn’t have a nervous system like ours? Thus, the identity thesis seems too restricting.

But does identifying the mind with the function of the nervous system also exclude too much? What if we were to say that the mind is identical to the function of the entire body + brain and not just the nervous system alone? After all, it seems like the “internal milieu” of the body might play a functional role of such importance that it would be problematic to simply identify the mind with the nervous system and not the total system of brain + body e.g. the diffusion of hormones in the blood system seems to play a functional role in mental processes. On this view, the nervous system is simply too entangled with the body for there to be a clear-cut psychological distinction of brain and body. To acknowledge the role of the body in cognition and “what it is like” to be a human animal would be to emphasize an “embodied” perspective. So it seems we have recourse for saying that the mind is not identical to the nervous system, and that it might actually supervene on the total brain-body system given that importance of the bodily milieu for determining what it is like to be human (Williams 2011).

Check Your Progress I

Note: Use the space provided for your answers.

1) What is the fundamental presupposition of neurobiology?

.....

2) What is mental state for a behaviorist?

.....

Computer Science

Computer science concerns itself with the automatic processing of information (or at least with physical systems of symbols to which information is assigned) by means of such things as computers. From the beginning, computer programmers have been able to develop programs which permit computers to carry out tasks for which organic beings need a mind. A simple example is multiplication. But it is clear that computers do not use a mind to multiply. Could they, someday, come to have what we call a mind? This question has been propelled into the forefront of much philosophical debate because of investigations in the field of artificial intelligence (AI) (PoM 2011).

Within AI, it is common to distinguish between a modest research program and a more ambitious one: this distinction was coined by John Searle in terms of a weak AI and strong AI. The exclusive objective of "weak AI", according to Searle, is the successful simulation of mental states, with no attempt to make computers become conscious or aware, etc. The objective of strong AI, on the contrary, is a computer with consciousness similar to that of human beings. The program of strong AI goes back to one of the pioneers of computation Alan Turing. As an answer to the question "Can computers think?", he formulated the famous Turing test. Turing believed that a computer could be said to "think" when, if placed in a room by itself next to another room which contained a human being and with the same questions being asked of both the computer and the human being by a third party human being, the computer's responses turned out to be indistinguishable from those of the human. Essentially, Turing's view of machine intelligence followed the behaviourist model of the mind—intelligence is as intelligence does. The Turing test has received many criticisms, among which the most famous is probably the Chinese room thought experiment formulated by Searle (PoM 2011).

The question about the possible sensitivity (qualia) of computers or robots still remains open. Some computer scientists believe that the specialty of AI can still make new contributions to the resolution of the "mind body problem". They suggest that based on the reciprocal influences between software and hardware that takes place in all computers, it is possible that someday theories can be discovered that help us to understand the reciprocal influences between the human mind and the brain.

Cognitive Science

Cognitive science is the interdisciplinary scientific study of minds as information processors. It includes research on how information is processed (in faculties such as perception, language, reasoning, and emotion), represented, and transformed in a (human or other animal) nervous system or machine (e.g., computer). Cognitive science consists of multiple research disciplines, including psychology, artificial intelligence, philosophy, neuroscience, linguistics, anthropology, sociology, and education. It spans many levels of analysis, from low-level learning and decision mechanisms to high-level logic and planning; from neural circuitry to modular brain organization. Its intellectual origins are in the mid-1950s when researchers in several fields began to develop theories of mind based on complex representations and computational procedures

The term cognitive science was coined by Christopher Longuet-Higgins in 1973. It incorporates the interdisciplinary study of mind and intelligence, embracing philosophy, psychology, artificial intelligence.

2.3 PHILOSOPHY OF MIND AND THE CONTINENTAL TRADITION

Most of the discussion in this article has focused on one style or tradition of philosophy in modern Western culture, usually called analytic philosophy (sometimes described as Anglo-American philosophy). Many other schools of thought exist, however, which are sometimes subsumed under the broad label of continental philosophy. In any case, though topics and methods here are numerous, in relation to the philosophy of mind the various schools that fall under this label (phenomenology, existentialism, etc.) can globally be seen to differ from the analytic school in that they focus less on language and logical analysis alone but also take in other forms of understanding human existence and experience. With reference specifically to the discussion of the mind, this tends to translate into attempts to grasp the concepts of thought and perceptual experience in some sense that does not merely involve the analysis of linguistic forms (Gertler 2007).

In Georg Wilhelm Friedrich Hegel's *Phenomenology of Mind*, Hegel discusses three distinct types of mind: the 'subjective mind', the mind of an individual; the 'objective mind', the mind of society and of the State; and the 'Absolute mind', a unity of all concepts. In modern times, the two main schools that have developed in response or opposition to this Hegelian tradition are phenomenology and existentialism. Phenomenology, founded by Edmund Husserl, focuses on the contents of the human mind and how phenomenological processes shape our experiences. Existentialism, a school of thought founded upon the work of Søren Kierkegaard and Friedrich Nietzsche, focuses on the content of experiences and how the mind deals with such experiences (PoM 2011).

2.4 PHILOSOPHY OF MIND AND BUDDHISM

"If one were to ask, 'Which aging & death? And whose is this aging & death?' and if one were to ask, 'Is aging & death one thing, and is this the aging & death of someone/something else?' both of them would have the same meaning, even though their words would differ. When there is the view that the *jiva* is the same as the body, there isn't the leading of the holy life. And when there is the view that the *jiva* is one thing and the body another, there isn't the leading of the holy life. Avoiding these two extremes, the *Tathagata* points out the *Dhamma* as the in between: From birth as a requisite condition comes aging & death."

In fact, Buddhism does not hold to the dualistic mind/body model but do assert that the mind and body are separate entities. Buddhism does not hold to the notion of an independent and eternal soul, or atman. Some forms of Buddhism assert that a very subtle level of mind leaves the body at the time of death and goes to a new life. According to Buddhist scholar Dharmakirti, the definition of mind is that which is clarity and cognizes. In this definition, 'clarity' refers to the nature of mind, and 'cognizes' to the function of mind. Mind is clarity because it always lacks form and because it possesses the actual power to perceive objects. Mind cognizes because its

function is to know or perceive objects. In Ornament of the Seven Sets, Buddhist scholar Khedrubje holds that thought, awareness, mind and cognizer are synonyms.

In fact, Buddha explained that although mind lacks form, it can nevertheless be related to form. Thus, our mind is related to our body and is "located" at different places throughout the body. This is to be understood in the context of how the five sense consciousnesses and the mental consciousness are generated. There are many different types of mind—sense awarenesses, mental awarenesses, gross minds, subtle minds, and very subtle minds—and they are all formless (lacking shape, color, sound, smell, taste or tactile properties) and they all function to cognize or know. There is no such thing as a mind without an object known by that mind. Even though none of these minds is form, they can be related to form (PoM 2011).

Check Your Progress II

Note: Use the space provided for your answers.

1) What is cognitive science?

.....

.....

.....

2) Does Buddhism hold a dualistic understanding of body and mind?

.....

.....

.....

2.5 PHILOSOPHY OF MIND AND GENERAL PHILOSOPHY

After seeing the relationship of philosophy of mind to other disciplines, we want to situate it in General Philosophy itself. Various useful notions from general philosophy have been related to philosophy of mind. In this section, we note some such theoretical notions that help us to understand philosophy of mind better.

Intentionality

The rich concept of intentionality, taken from phenomenology, is the capacity of mental states to be directed towards (about) or be in relation with something in the external world. This property of mental states entails that they have contents and semantic referents and can therefore be assigned truth values. When one tries to reduce these states to natural processes there arises a problem: natural processes are not true or false, they simply happen. It would not make any sense to say that a natural process is true or false. But mental ideas or judgments are true or false, so how then can mental states (ideas or judgments) be natural processes? The possibility of assigning semantic value to ideas must mean that such ideas are about facts. Thus, for example, the idea that Herodotus was a historian refers to Herodotus and to the fact that he was an historian. If the fact is true, then the idea is true; otherwise, it is false. But where does this relation come from? In the brain, there are only electrochemical processes and these seem not to have anything to do with Herodotus (PoM 2011).

Functionalism

Functionalism is another concept from general philosophy that has been reformulated by Hilary Putnam and Jerry Fodor and used in philosophy of mind. Putnam and Fodor saw mental states in terms of an empirical computational theory of the mind. At about the same time or slightly after, D.M. Armstrong and David Kellogg Lewis formulated a version of functionalism which analyzed the mental concepts of folk psychology in terms of functional roles. Finally, Wittgenstein's idea of meaning as use led to a version of functionalism as a theory of meaning, further developed by Wilfrid Sellars and Gilbert Harman. Another one, psychofunctionalism, is an approach adopted by naturalistic Philosophy of Mind associated with Jerry Fodor and Zenon Pylyshyn.

What all these different varieties of functionalism share in common is the thesis that mental states are characterized by their causal relations with other mental states and with sensory inputs and behavioral outputs. That is, functionalism abstracts away from the details of the physical implementation of a mental state by characterizing it in terms of non-mental functional properties. For example, a kidney is characterized scientifically by its functional role in filtering blood and maintaining certain chemical balances. From this point of view, it does not really matter whether the kidney be made up of organic tissue, plastic nanotubes or silicon chips: it is the role that it plays and its relations to other organs that define it as a kidney.

Emergentism

Emergentism is a form of "nonreductive physicalism" that involves a layered view of nature, with the layers arranged in terms of increasing complexity and each corresponding to its own special science. Some philosophers hold that emergent properties causally interact with more fundamental levels, while others maintain that higher-order properties simply supervene over lower levels without direct causal interaction. The latter group therefore holds a less strict, or "weaker", definition of emergentism, which can be rigorously stated as follows: a property P of composite object O is emergent if it is metaphysically impossible for another object to lack property P if that object is composed of parts with intrinsic properties identical to those in O and has those parts in an identical configuration.

Sometimes emergentists use the example of water having a new property when Hydrogen H and Oxygen O combine to form H₂O (water). In this example there "emerges" a new property of a transparent liquid that would not have been predicted by understanding hydrogen and oxygen as a gas. This is analogous to physical properties of the brain giving rise to a mental state. Emergentists try to solve the notorious mind-body gap this way. One problem for emergentism is the idea of "causal closure" in the world that does not allow for a mind-to-body causation (PoM 2011).

Expressional Philosophy states that there are no dualisms, only that which is expressed, as Water is to the dualistic H₂O in the above example. Mind emerges from processes of Matter and the Energies these processes bring about. Al Engleman proposes in "Expressions: A Philosophy of Mind", a finality to William Blake's "I am My Mind", by stating that all Matter and Energy is Mind, what he calls Proto-Mind, and from this Proto-Mind's processes, a threshold barrier is overcome, and Life emerges as Self-Working Energy (Mind). This is called Expressional

Emergence, in much the same way Genetic Biologists understand the Genotype-Phenotype Expression.

Eliminative materialism

If one is a materialist and believes that all aspects of our common sense psychology (or “folk-psychology”) will find reduction to a mature cognitive-neuroscience, and that non-reductive materialism is mistaken, then one can adopt a final, more radical position: eliminative materialism.

Also called eliminativism, it is a materialist position. Its primary claim is that people's common-sense understanding of the mind (or “folk psychology”) is false and that certain classes of mental states that most people believe in do not exist. Some eliminativists argue that no coherent neural basis will be found for many everyday psychological concepts such as belief or desire, since they are poorly defined. Rather, they argue that psychological concepts of behaviour and experience should be judged by how well they reduce to the biological level.[1] Other versions entail the non-existence of conscious mental states such as pain and visual perceptions (EM 2011).

There are several varieties of eliminative materialism, but all maintain that our common-sense “folk psychology” badly misrepresents the nature of some aspect of cognition. Eliminativists regard folk psychology as a falsifiable theory, and one likely to be falsified by future cognitive-neuroscientific research. Should better theories of the mental come along they argue, we might need to discard certain basic common-sense mental notions that we have always taken for granted, such as belief, consciousness, emotion, qualia, or propositional attitudes (PoM 2011).

Externalism and Internalism

Where is the mind located? If the mind is a physical phenomenon of some kind, it has to be located somewhere. There are two possible options: either the mind is internal to the body (internalism) or the mind is external to it (externalism). More generally, either the mind depends only on events and properties taking place inside the subject's body or it depends also on factors external to it. Proponents of internalism are committed to the view that neural activity is sufficient to produce the mind. Proponents of externalism maintain that the surrounding world is in some sense constitutive of the mind.

Externalism differentiates into several versions. The main ones are semantic externalism, cognitive externalism, phenomenal externalism. Each of these versions of externalism can further be divided whether they refer only to the content or to the vehicles of mind. Semantic externalism holds that the semantic content of the mind is totally or partially defined by state of affairs external to the body of the subject. Hilary Putnam's Twin earth thought experiment is a good example (PoM 2011).

Cognitive externalism is a very broad collection of views that suggests the role of the environment, of tools, of development, and of the body in fleshing out cognition. Embodied cognition, The extended mind, enactivism are good examples. Phenomenal externalism suggests that the phenomenal aspects of the mind are external to the body.

Qualia and Physicalism

The thesis of physicalism is that the mind is part of the material (or physical) world. Such a position faces the problem that the mind has certain properties that no other material thing seems to possess. Physicalism must therefore explain how it is possible that these properties can nonetheless emerge from a material thing. The project of providing such an explanation is often referred to as the "naturalization of the mental." Some of the crucial problems that this project attempts to resolve include the existence of qualia (PoM 2011).

Many mental states seem to be experienced subjectively in different ways by different individuals. And it is characteristic of a mental state that it has some experiential quality, e.g. of pain, that it hurts. However, the sensation of pain between two individuals may not be identical, since no one has a perfect way to measure how much something hurts or of describing exactly how it feels to hurt. Philosophers and scientists therefore ask where these experiences come from. The existence of cerebral events, in and of themselves, cannot explain why they are accompanied by these corresponding qualitative experiences. The puzzle of why many cerebral processes occur with an accompanying experiential aspect in consciousness seems impossible to explain.

Yet it also seems to many that science will eventually have to explain such experiences. This follows from an assumption about the possibility of reductive explanations. According to this view, if an attempt can be successfully made to explain a phenomenon reductively (e.g., water), then it can be explained why the phenomenon has all of its properties (e.g., fluidity transparency). In the case of mental states, this means that there needs to be an explanation of why they have the property of being experienced in a certain way.

The 20th century German philosopher Martin Heidegger criticized the ontological assumptions underpinning such a reductive model, and claimed that it was impossible to make sense of experience in these terms. This is because, according to Heidegger, the nature of our subjective experience and its qualities is impossible to understand in terms of Cartesian "substances" that bear "properties." Another way to put this is that the very concept of qualitative experience is incoherent in terms of – or is semantically incommensurable with the concept of – substances that bear properties (Cooney 2000).

Check Your Progress III

Note: Use the space provided for your answers.

1) What is emergentism?

.....

.....

.....

2) What is the primary claim of eliminative materialism?

.....

.....

.....

2.6 LET US SUM UP

In this unit we saw how philosophy of mind is truly an inter-disciplinary search. It borrows from many other disciplines and works as a sub-discipline of general philosophy. We saw how it is related to the continental tradition and Buddhism.

2.7 KEYWORDS

Behaviourism: It is an approach to psychology that emphasizes observable measurable behaviour. It denies any independent significance for intentions and assumes that behaviour is determined by the environment.

Emergentism: Emergentism (or theory of emergence) is a theory concerning the nature of the material world. In contrast to reductionistic materialism, which asserts that only the tiniest components of matter have unique properties, emergentism maintains that along with complexity, and especially with structure and function, go properties that are unique and that are not to be found in the tiniest components of matter. These properties of more complex systems are therefore not reducible to those of their constituent elements, though they could not exist without them. While many of the fundamental properties of matter, such as mass, are held to be merely quantitative and additive, emergent properties are said to be qualitative and novel or non-predictable.

Qualia: A quality or property as perceived or experienced by a person. Such a property, such as whiteness, considered independently from things having the property.

2.8 FURTHER READINGS AND REFERENCES

Cooney, Brian. *The Place of Mind*. Belmont: Wadsworth Thomson Learning, 2000.

Gertler B, Shapiro LA. *Arguing About the Mind*. Routledge, New York: Routledge, 2007.

Leudar I, Costall A. *Against Theory of Mind*. Basingstoke New York: Palgrave Macmillan, 2009.

Stich SP, Warfield TA. *The Blackwell Guide to Philosophy of Mind*. Blackwell Pub., Malden: Blackwell Publ, 2003.

EM (Eliminative materialism). In *Wikipedia, The Free Encyclopedia*. Retrieved 02:11, May 25, 2011, from http://en.wikipedia.org/w/index.php?title=Eliminative_materialism&oldid=428726184.

PoM (Philosophy of mind). In *Wikipedia, The Free Encyclopedia*. Retrieved 03:20, May 17, 2011, from http://en.wikipedia.org/w/index.php?title=Philosophy_of_mind&oldid=428916752.

Christensen SM, Turner DR *Folk Psychology and the Philosophy of Mind*. L. Erlbaum, Hillsdale: 1993.

Gunderson, K. *Language, Mind, and Knowledge*. Minneapolis: University of Minnesota Press, 1975.

Guttenplan SD. *A Companion to the Philosophy of Mind*. Blackwell Reference, Oxford: Cambridge, 1994.



UNIT 3 MIND AND ANIMALS

Contents

- 3.0 Objectives
- 3.1 Introduction
- 3.2 Mind and Animals: Philosophy and Science
- 3.3 The Behaviorist Turn
- 3.4 The Ethical Implications of Denying Mind to the Animals
- 3.5 Animal Consciousness
- 3.6 Arguments for and against Animal Consciousness
- 3.7 Let us Sum Up
- 3.8 Key Words
- 3.9 Further Readings and References

3.0 OBJECTIVES

After going through this unit the students are expected to have a brief understanding of pre-behaviorist philosophical understanding of the issue of animal mind, the behaviorist turn in the scientific world, the ethical implications of affirming or denying of animal consciousness, and the arguments for and against animal consciousness.

3.1 INTRODUCTION

Considering the sense of continuum in the overarching theory of evolution by Charles Darwin, it is impossible to consider that the animals are without any trace of mind. Though the twentieth century thinkers seem to think in the lines that the animals do not have mind, many of their philosophical ancestors did not seem to think so. This kind of a thought must have evolved mainly due to the impact of behaviorism and scientific evolution. Animals were objects to be made use of in the labs and in other sectors, than to be loved and cared for. In order to facilitate such a utilitarian approach we needed a theory where the animals did not have thinking capacity nor felt pain. In this unit, we will look at different approaches to mind and animals: what do we mean by mind; do animals seem to think; and what do we mean when the animals do not have a mind.

3.2 MIND AND ANIMALS: PHILOSOPHY AND SCIENCE

It is important to ask if other animals other than humans have a genetic endowment and social environment that allows them to acquire a theory of mind just as the human children do. This is a debatable issue as it involves the problem of inferring the existence of thinking from animal behavior. Knowing anything of the development of the theory of mind in animals and the environmental pressures that they face is difficult as we lack significant number of natural observations.

Non-human research is especially useful in illuminating which nonverbal behaviors signify components of theory of mind, and in pointing to possible stepping points in the evolution of what many claim to be a uniquely human aspect of social cognition. While it is difficult to study human-like theory of mind and mental states in species which we do not yet describe as ‘minded’ at all, and about whose potential mental states we have an incomplete understanding, researchers can focus on simpler components of more complex capabilities. Yet another difficulty is in the interpretation of the result of the scientific researches. There have been controversies over the interpretation of evidence purporting to show theory of mind ability—or inability—in animals. We will come back to the approach of science towards the theory of minds in the animals later in the unit and now we will look at how the issue was approached by some of the modern philosophers.

Though the later empiricists almost decided upon the hypothesis that animals did not have minds, their predecessors seem to have never doubted the possibility of animals having a mind, be it in a lesser degree or of functionally inferior. Critiquing the Cartesian claim that the animals were only machines, John Locke made clear statements about his beliefs in their mental states. He claims that perception is indubitably in all animals (Locke, 117) and hence they have some ideas. If they possessed some ideas, then they could not be termed mere machines as would some Cartesians. Locke makes it clear that the animals can reason but without the ability to abstract.

“It seems as evident to me, that they do some of them in certain instances reason, as that they have sense; but it is only in particular ideas, just as they received them from their senses. They are the best of them tied up within those narrow bounds, and have not (as I think) the faculty to enlarge them by any kind of abstraction” (Locke, 127). He also mocks those who would claim that “that dogs or elephants do not think, when they give all the demonstration of it imaginable, except only telling us that they do so” (Locke, 87). Here the differentiating issue seems to be that of not being able to tell that they do. We will look at it in a latter section.

David Hume, worth the title of the greatest skeptic of all time, while denying the ultimate knowability of everything that was thinkable to us, doubtlessly establishes the case of animal mind. In the *Treatise*, “of the Reason of Animals” (sec.XIV), he wonders if there was anything more clear than the existence of animal mind. “Next to the ridicule of denying an evident truth, is that of taking much pains to defend it; and no truth appears to me more evident, than that beasts are endowed with thought and reason as well as men. The arguments are in this case so obvious, that they never escape the most stupid and ignorant” (Hume, 176). It is very likely that what Hume had in mind, when affirming that animal mind is obvious to all but the most benighted, was animal users’ understanding of their animals’ physical and mental states, an understanding presuppositional to working with them.

Now this line of thought ran through the subsequent empiricist British philosophy. Jeremy Bentham and John Stuart Mill drew moral consequences from animals’ ability to feel pain and thus of the necessity of them being included in the scope of utilitarian moral concern. Bentham famously declared that neither the texture of the skin nor the ability to speak nor the ability to worship were not sufficient reasons to inflict torture on the animals as we know today that the color of the human skin is no reason to make any discrimination. He believed that humanity may one day come to include them into the fold of beings that require rights for the very reason that they are sensitive (Bentham, 310–311). Mill also affirmed that the reason for legal interventions in favour of children apply in no way less to the case of those unfortunate slaves – the animals.

Thus we see strong claims of animal mentation in empiricism, from Hume's claim of animal reason to Bentham's and Mill's affirmation of animals' ability to feel pain. But this line of thinking got a scientific touch only in the works of Charles Darwin. Darwinian science gave new vitality to ordinary commonsense notions that attributed mental states to animals, though it had been assaulted by Catholics and Cartesians. Darwin believed in continuity as a prime principle in psychology and in his 1872 work, *The Expressions of Emotions in Man and Animals* he mocked the Cartesian notion and in the *decent of man* in the previous year, specifically affirmed that "there is no fundamental difference between man and the higher animals in their mental faculties" and that "the lower animals, like man manifestly feel pleasure and pain, happiness and misery". In the same work, he attributed the entire range of subjective experiences to animals. Evolutionary theory demands that psychology, like anatomy, be comparative, for life is incremental, and mind did not arise de novo in man.

Darwin, it seems, handed over much of his material data on animal mentation to his trusted spokesman George John Romanes, who in his preface to *Animal Intelligence* acknowledges his indebtedness to Darwin. His famous book is *Mental Evolution in Animals*. Both these books highly evidence phylogenetic continuity of mentation. While Romanes' work mainly focused on cognitive ability throughout the phylogenetic scale, he also addresses emotions and other aspects of mental life. Other than claims or suppositions, Darwinian claims were well rooted in experiments. Darwin spent good amount of his life learning about animal behaviour and to trace if the animals acted from pure impulse or instinct or they possessed some sort of intelligence. In his work, *The formation of vegetable Mould through the action of worms with observations on their habits* (1886), he observed and experimented on the behavior of the earthworms and concluded that the worms possessed rudimentary intelligence, in that they showed plasticity in their behavior, some rudimentary "notion" of shape and the ability to learn from experience.

3.3 THE BEHAVIORIST TURN

Now considering the voluminous work of Charles Darwin, it may be assumed that a strong foundation of science was formed for the later scientists and theorists to learn a great deal about animal mentation. But what happened later on seems to be unfortunate. The overarching influence of behaviourism and mechanistic interpretation of the entire scientific agenda overturned what was already building up. To decide against a scientific proposition, an assumption has to be either empirically disconfirmed or proved conceptually flawed. But in the case of animal minds, neither of the two happened. There was no empirical disconfirmation of animal consciousness nor was there any conceptual or logical flaw found in its postulation. But what really happened was that the knowability of animal consciousness was disproved.

The knowability of animal consciousness was disproved, disvalued and banished by a valuational revolution on its approach towards an objective psychology. In deciding what a real science should be and how could psychology be a 'real' science, dubious or difficult to prove topics such as animal consciousness was dismantled. But the entire assumption of animal mentation was not disproved. In man's pursuit of making science wholly empirical, other animals in particular must have lost their chance of proving that they were not so different from the human species. The picture rather well fits into man's scheme of things to have animals those

never thought nor felt any pain. It seems that the view that animals have subjective experiences and that these could be studied was given up not because it did not generate fruitful research programmes. It is not the fact. In people like Darwin and Romanes, it surely did. Nor it was given up as it did not explain to us or allow us to predict the animal behavior. Neither was there any inconsistency or incoherence shown in the assumption. But the project was abandoned due to major valuational concerns. Psychology became something that dealt mainly with “stimulus and response, habit formations, habit integrations and the like”.

The impact of such an approach, different from other preceding approaches including that of Darwin, should reflect on the understanding of the human nature as well. It should reject consciousness in humans as well or at least its knowability. But this behaviorist approach was well received by the public. To a people with its contempt for the genetic bases of behavior, a prospect of a science that would give birth to a technology – the ability to control and shape behavior gave new hope. The whole of behaviourist approach thus played well to the general public with the hope that it provided in rehabilitating the criminals, educating the children properly and producing a better society. It gave a new optimism about social engineering and the ability to modify human behavior just as we gained control over the frontiers and reshaped nature. The denial of mind to animals was inimical to the basic tenets of ordinary common sense. Human common sense never denied mind to the animals. Man would have been surprised by the stance that science had taken but then the common mind was never concerned about what science said and believed unless it had direct implications to his belief systems. But this kind of a scientific approach was without serious implications. Denying mind to the animals had great influence in forming our attitude towards the animals and how we treat them. Our ethical values were reframed.

3.4 THE ETHICAL IMPLICATIONS OF DENYING MIND TO THE ANIMALS

The moral implications of denying mentation or felt pain to animals have come heavily on the unfortunate animals as we happen to see today. Numerous initiatives for the care and well being of the animals at the international and domestic level point to the fact the treatments that are meted out to the animals are not that fare, and that they do not deserve that. How far the philosophical and scientific stand on the issue of animals and mind has caused this kind of a treatment is worth having a look at.

The moral implications of denying animal mind or even felt pain became apparent in the second half of the 20th century when social concerns for animals started surfacing as the nature of animal usage in agriculture and research itself changed. Here the animal wellbeing was severely compromised and the increased usage of animals wherever human beings could not be used was due to, to a great degree, the apparent denial of thinking capacity to animals. Around the mid 20th century, animal usage became severe and extreme than that had ever occurred since the domestication of animals. They were used as objects of human enjoyment. Animals were used in huge numbers in agriculture. Previously there was a concerned relation with the animals while they were being used in agricultural setups. They were cared and provided for as was required by their nature, be it food, water, medication, security etc. Here both man and animals benefitted from each other's company, from what is called the ‘ancient contract’. Animal husbandry became ingrained as an ethical and prudential imperative; proper care was essential to success,

for the physical and psychological well being of the animals were essential for the success of the agriculture enterprise.

The ethical formula that pervaded animal use during this period was avoiding deliberate, unnecessary, sadistic cruelty or outrageous neglect of animals such as not feeding and watering them. This ethical approach is seen clearly stated in the sacred texts of major religions. Hurting animals was considered equal to that of hurting humans. And this is well presented in the criminal laws of every civilized society since the 1800s.

But this ancient contract and practice could not survive the emergence of modern science based technology. By the mid 20th century, agriculture had become industrialized and the academic departments of animal husbandry were transmuted into departments of animal science. This animal science has been defined as the “application of industrial methods to the production of animals.” Industry supplanted husbandry and agriculture became exploitative rather than symbiotic. Animal welfare was severed from productivity and profit. And with the industrial model came the irrelevance of animal thoughts and feeling, yielding what is aptly called “animal machines”

Another development that happened in the mid-20th century was the increased use of the animals in research. Unlike the scenario of mutual benefit in the agricultural set up, the massive amounts of animal testing and research was highly aimed at human benefit. The animals did not gain much from these efforts other than being inflicted with diseases, fractures, wounds, burns, lesions with no offsetting benefit. And thus another major animal use emerged violating the ancient contract. It has reached its pinnacle of exploitation when animals are being used in large numbers for cosmetic testing. Injuries and burns are inflicted irrationally on neither hapless animals for something that neither benefits man nor animals largely. It is appreciable that the international community is becoming aware of this fact and sincere efforts are being made to ban such practices.

Cartesian model of animals as non-conscious, biological machines must have given an impetus to the most extreme and morally relevant fact of denying ideologically and completely disregarding felt pain in animals. The denial of felt pain is important as it leads to further moral concerns. As far as Bentham and Mill are concerned, they made it the sine qua non for moral status. Because once pain is denied, the denial of more abstract morally relevant mental states such as suffering automatically follows. If one denies simple pain consciousness in an animal, one is logically bound to deny more complex mental states which require greater sophistication of consciousness. May be, we need to redefine pain as something that needs language as a necessary precondition for the ability to feel. The animals might feel pain though they may not have a concept that they have pain. The phenomenal aspect cannot be denied and it must be the same with the case of having mental states. We know there cannot be a quality difference when it comes to the animal and human mind. But we know they differ in some way. In the next section, we will look at what really differentiates between mind in humans and animals.

3.5 ANIMAL CONSCIOUSNESS

There are many reasons for philosophical interest in nonhuman animal consciousness. First, if philosophy often begins with questions about the place of humans in nature, one way humans have attempted to locate themselves is by comparison and contrast with those things in nature most similar to themselves, i.e., other animals. Second, the problem of determining whether animals are conscious stretches the limits of knowledge and scientific methodology (beyond breaking point, according to some). Third, the question of whether animals are conscious beings or “mere automata”, as Cartesians would have it is of considerable moral significance given the dependence of modern societies on mass farming and the use of animals for biomedical research. Fourth, while theories of consciousness are frequently developed without special regard to questions about animal consciousness, the plausibility of such theories has sometimes been assessed against the results of their application to animal consciousness.

Questions about animal consciousness are just one corner of a more general set of questions about animal cognition and mind. The so-called “cognitive revolution” that took place during the latter half of the 20th century has led to many innovative experiments by comparative psychologists and ethnologists probing the cognitive capacities of animals. The topic of consciousness per se in animals has remained controversial, even taboo, among scientists, even while it remains a matter of common sense to most people that many other animals do have conscious experiences.

It is not easy for us to conclude if the non-human species are conscious. All that we know is that they may not be conscious the way humans are. We know chimps and dolphins show awareness, but going down in the grade of animal life – we feel many other functions as unconscious mechanisms. The tiny brains in many simple animals are good enough to do just controlling basic bodily functions. It may not be due to any sort of species chauvinism in our thinking. “Below a certain threshold, it’s quite possible there’s no subjective experience,” says cognitive psychologist Dedre Gentner of Northwestern University. “I don’t know that you need to ascribe anything more to the behavior of a cockroach than a set of local reflexes that make it run away from bad things and toward good things.” In many of the lower organisms, we see such kind of stimuli - reaction process without much thinking being involved. But coming up in the hierarchy, the higher animals may have better ways of understanding and responding to the environment wherever they are.

Certain skills are considered key signs of higher mental abilities: good memory, a grasp of grammar and symbols, self-awareness, understanding others' motives, imitating others, and being creative. Bit by bit, in ingenious experiments, researchers have documented these talents in other species, gradually chipping away at what we thought made human beings distinctive, while offering a glimpse of where our own abilities came from. Scrub jays know that other jays are thieves and that stashed food can spoil; sheep can recognize faces; chimpanzees use a variety of tools to probe termite mounds and even use weapons to hunt small mammals; dolphins can imitate human postures; the archerfish, which stuns insects with a sudden blast of water, can learn how to aim its squirt simply by watching an experienced fish perform the task.

Most scientists today believe that awareness is probably controlled by a sort of cognitive rheostat, with conscious awareness burning brightest in humans and other high animals and fading to a flicker – and finally blackness in very low ones. Many of the cognitive psychologists

do not just deny animal consciousness. “It would be perverse to deny consciousness to mammals,” says Steven Pinker, a Harvard psychologist and the author of *The Stuff of Thought*. “Birds and other vertebrates are almost certainly conscious too. When it gets down to oysters and spiders, we’re on shakier ground.”

There are certainly differences among different animal species when it comes to the question of thinking and intellect. The question now may be what causes these differences. The fall of intellect on a sliding scale among the animals that are aware of their existence is often attributed to the brain size. But this may not be a fact. Comparing with the size of the brains of dolphin (1,700 g or 3.75 lb.) or the killer whale (5,600-g or 12.3 lb.), we possess a relatively smaller one (about 1,400 g or 3 lb). But we of course know that intellect does not fit into the same scale. If we take on to the point that in comparison to the body size we end up having the biggest brain, the fact remains something different. The brain of the Etruscan shrew weighs just 0.1 g (0.0035 oz.), yet relative to its tiny body, its brain is bigger than ours. It clearly shows that the brain size is not going to give us an explanation for the difference between man and the other animal species. But, if we look with more of an evolutionary approach, the structure of the brain might have something to tell us.

More than the size of the brain, its structure seems to be more important. More of those regular, automatic and unconscious activities of the body are controlled by the evolutionarily older parts of the brain and thinking and other higher faculties take place in the cortex, something that is relatively new in the evolutionary chain. It is the most evolved part of the brain and many of the animals lack it. Among the mammals, who are members of the cortex club, the intelligence of the animal is determined by the size and the complexity of that brain region. But even this assumption is not conclusive. While man is a master of tool usage, we find other animals like apes and otters using tools too. Though the ways are primitive, yet they count as signs of thinking and creativity.

We have had many biases against the animal species. Though we are not conclusive as to where to draw the lines, many of them are getting dissolved. Once we believed that the animals do not use tools, but now we know that the apes and birds do so. Then we thought that that humans alone were empathetic and generous. But monkeys practice charity and the elephants mourn their dead. We also believed that humans alone experienced joy and a knowledge about the future. But a recent UK study Showed that pigs raised in comfortable environments exhibit optimism, moving expectantly toward a new sound instead of retreating warily from it. There are animals who understands language and communicate, though not with that expertise and ease as humans.

As far as a theory of mind is concerned, it seems that we need to be more open and inquisitive while dealing with animal consciousness. studying the brains alone may not suffice, we may need to learn more about how they mind their world – how they respond to their environment. Blue jays, another corvid, cache food for later retrieval and are very mindful of whether other animals are around to witness where they've hidden a stash. If the jays have indeed been watched, they'll wait until the other animal leaves and then move the food. They not only understand that another creature has a mind; they also manipulate what's inside it. So out rightly denying mind to animals may not be the right way to approach the question.

The glimpse of consciousness in non-human animals is further proved while looking at how far the other animals have a sense of self. The standard method of demonstrating an understanding of the self and other distinction is the mirror test. It is to see if the animals recognize themselves in a mirror reflection. Though most of the time animals take the reflection for some other animals, higher animals like the elephants, apes and dolphins really succeed in understanding their reflection in the mirror. All three respond appropriately when they look in a mirror after a spot of paint is applied to their forehead or another part of their body. Apes and elephants will reach up to touch the mark with finger or trunk rather than reach out to touch the reflection. Dolphins will position themselves so they can see the reflection of the mark better. "If you put a bracelet on an orangutan and put it in front of a mirror, it doesn't just look at the bracelet," says Bhagavan Antle, Director of the Institute of Greatly Endangered and Rare Species in Myrtle Beach, S.C. "It puts the bracelet up to its face and shakes it. It interacts with its reflection."

Ultimately, the same biological knob that adjusts animal consciousness up or down ought to govern how we value the way those species experience their lives. A mere ape in our world may be a scholar in its own, and the low life of any beast may be a source of deep satisfaction for the beast itself.

3.6 ARGUMENTS FOR AND AGAINST ANIMAL CONSCIOUSNESS

The most common reason for people to believe in animal consciousness is that the animals are similar to us in many ways. When asked, why people think familiar animals such as their pets are conscious, they would point to similarities between the behavior of those animals and human behavior. Similarity arguments for animal consciousness thus have roots in common sense observations. But they may also be bolstered by scientific investigations of behavior and neurology as well as considerations of evolutionary continuity (homology) between species. Nagel's own confidence in the existence of phenomenally conscious bat experiences is based on nothing more than this kind of reliance on shared mammalian traits. Neurological similarities between humans and other animals have also been taken to suggest commonality of conscious experience. All mammals share the same basic brain anatomy, and much is shared with vertebrates more generally. Even structurally different brains may be neurodynamically similar in ways that enable inferences about animal consciousness to be drawn.

This form of inference would be strengthened by a good understanding of the biological function or functions of consciousness. If consciousness is understood as something that is evolved for the purpose of better adjusting with the environment, then there may not be a problem in understanding consciousness as something that is progressing from other primates to the humans.

There are more recent philosophers of the mind like Dennett or Jamieson arguing that our understanding of the mental states of animals has more in common with perception and interpretation rather than inference. Though the interpretivist theory may lack the scientific vigor to face demands for justification in the legal and ethical contexts, it is true that familiarity with a dog makes one a more sensitive interpreter of its emotional and cognitive states than other observers. Nevertheless, even among scientists who are sympathetic to the idea of themselves as sensitive observers of animals with rich mental lives, there is the recognition that the larger

scientific context requires them to provide a particular kind of empirical justification of mental state attributions.

One of the reasons placed against animal consciousness is that the animals do not use language conversationally or reason generally. Based on the alleged failure of animals to display certain intellectual capacities, it is argued that the animals and humans are different and the animals therefore lack consciousness. But the absence of evidence for anything cannot be counted as an evidence of absence. Again based on the similarities of human and animal behaviour, a comparison is made between the animal behaviour and the routine and unconscious behaviour of the humans. All of the animal behaviour here is equaled to unconscious human 'automata' behaviours like driving unconsciously or the case of blind sight. But the view is based only on unsystematic observation of animal behavior. There are grounds for thinking that careful investigation would reveal that there is not a very close analogy between animal behavior and human behaviors associated with these putative cases of unconscious experience. Nevertheless, there are empirical grounds for concern that behavior suggesting consciousness in animals may be the product of unconscious processes.

Peter Carruthers, placing stock in the argument based on the higher order thought theory of consciousness, argue that the animals lack a theory of mind and therefore, consciousness. According to the higher order thought theory, to be conscious, to have phenomenal consciousness, one requires the capacity to think about, and therefore conceptualize, one's own thoughts. Such conceptualization requires a theory of mind. And as he maintains, there is little basis for thinking that any nonhuman animals have a theory of mind, with the possible exception of chimpanzees. Self-consciousness, having been taken as a scale to measure consciousness, deny animals of this faculty. But researches done with the help of mirror tests have been successfully cleared by many animals during different studies to show that some animals do have sense of self and can recognize themselves in a mirror. But the results of these studies and interpretations of the same are debatable.

3.7 LET US SUM UP

It seems that we may never know what the other animals feel like, as made famous by the Nagel's article, "what it is like to be a bat". To say if animals do have mind or consciousness, we may need more careful and intensified observations and studies. But what could be done is a more concerned approach towards the whole issue. Human way of understanding mind and intelligence may be different. But that does not entitle us to any better rights to exploit. One sure thought would be that we are a continuation of what the animals are. It may all be a matter of degree and approach. Different studies have eliminated our rather primitive biases about animal kingdoms and have started proving to us that animals are not those unconscious mechanistic objects without intelligence, thoughts or feelings. It is appreciable that there is an international conscience rising about the need for the concerned treatment of the animals.

3.8 KEY WORDS

Ancient Contract: Domestication of animals is based on an ancient contract between man and other domesticated animals, which guarantees benefits on both sides.

Behaviorism: the behaviorist school of thought maintains that behaviors as such can be described scientifically without recourse either to internal physiological events or to hypothetical constructs such as the mind.

Sine qua non: an indispensable condition, element, or factor; something essential

Cognitive Rheostat: It is a hypothesis about the functioning of consciousness. According to this, the act of becoming conscious of phenomena in any given modality involves the adjustment of that modality's 'rheostat'.

3.9 FURTHER READINGS AND REFERENCES

Bentham, Jeremy. *An Introduction to the Principles of Morals and Legislation*. New York: Hafner Press, 1948.

Carruthers, Peter. "Natural Theories of Consciousness." *European Journal of Philosophy*. 6 (1998a) 203–222.

Darwin, Charles. *The Descent of Man and Selection in Relation to Sex*. New York: Appleton, 1871.

Darwin, Charles. *The formation of vegetable mould, through the action of worms, with observations on their habits*. London: John Murray, 1881.

Dennett, Daniel C. "Animal consciousness and why it matters," *Social Research*, 62 (1995) 691–710.

Dennett, Daniel C. *Kinds of Minds: Towards an Understanding of Consciousness*, New York: Basic Books (Science Masters Series), 1997.

Hume, David. *A Treatise of Human Nature*. Oxford: Oxford University Press, 1968.

John Stuart Mill. *Principles of Political Economy*. Volume 2. 3rd Ed. London: John W. Parker and Son, 1852.

Locke, John. *An Essay Concerning Human Understanding*. 4th ed. Oxford: Oxford University Press, 1975.

Wall, Frans De. Et. al. *Primates and Philosophers: How Morality Evolved*. Princeton: Princeton University Press, 2006.

Watson, John B. "Psychology as the Behaviorist Views it". *Psychological Review* 20 (1913) 158-177.

"Animal Minds". *National Geographic*. September 2011.

<<http://ngm.nationalgeographic.com/2008/03/animal-minds/virginia-morell-text/2>>. (1 September, 2011).

Kluger, Jeffrey. "Inside the Minds of Animals". 5 Aug 2010.

<<http://www.time.com/time/magazine/article/0,9171,2008867,00.html#ixzz1SuhTD0If>>. (12 June, 2011).

"Theory of mind". <http://en.wikipedia.org/wiki/Theory_of_mind>. (14 June, 2011).

Allen, Colin, "Animal Consciousness", *The Stanford Encyclopedia of Philosophy* (Summer 2011 Edition), Edward N. Zalta (ed.), <<http://plato.stanford.edu/entries/consciousness-animal/>>. (12 June, 2011).

UNIT 4 MIND AND COMPUTERS

Contents

- 4.0. Objectives
 - 4.1. Introduction
 - 4.2. Machine Functionalism
 - 4.3. Machine Intelligence, Competency & Creativity
 - 4.4. Minds in Machines
 - 4.5. Strong AI & Weak AI (Reductionism & Non-Reductionism)
 - 4.5. Let Us Sum UP
 - 4.6. Key Words
 - 4.7. Further Readings and References
-

4.0 OBJECTIVES

The basic objective of unit is to show that the computational model of mind is that the brain is just a digital computer and that the mind is a software program. The machine functionalist program has been strongly influenced by analogies drawn from strong-AI and computer science in general, both in its general outlook and in several of its specific applications to problems about the nature of mind. The machine functional state of the mind is like a computational state of a computer. A computer program can be described as a functional organization of the hardware. The machine functionalists argue that mental states are like the 'information processing' states of a computer. According to the computer functionalism or artificial intelligence, the brain is a computer, and the mind is a computer program implemented in the brain.

4.1 INTRODUCTION

Machine functionalism may be defined as a theory that explains mental phenomena in terms of the external input and the observable output. It explains the mind as a complicated machine. In contemporary philosophy of mind, functionalism plays a vital role. Machine functionalism offers a perspective on the mind that offers a solution to a host of long-standing philosophical puzzles about minds and their relation to material bodies. Machine functionalism arose as a result of the meteoric rise of interest in computing machines and artificial intelligence. The machine functionalists say that mental processes are computational processes realized in a machine.

4.2 MACHINE FUNCTIONALISM

The central idea that holds Machine functionalism is the computational view of mind. In functionalism, the mind is a device capable of performing particular sorts of operation. A state of mind resembles a computational state and is at least, to some extent, sharable in principle by any number of material systems. If we understand computation at a fairly general level, we can see that the idea that mental processing is computation is a serious empirical hypothesis rather than a metaphor. Thus, to talk about minds and mental operations is to talk about machines and their states.

The point is that minds bear a relation to their material embodiments analogous to the relation computer programmes bear to the device on which they run. Perhaps every program is 'embodied' in some material device or the other. One might characterize a computer's dynamic behaviour as a causally connected sequence of physical-state descriptions, with transitions subsumed under various physical laws. According to Pylyshyn, very few of the physically discriminable properties of the machine are relevant to its computational function. For example, its colour, temperature, and mass, as well as its very slow or very fast electrical fluctuations, and so on. The very fact that any variations in physical properties of distinct components, other than those few properties to which other designated components are meant to relate in particular ways, can be said to be irrelevant to the machine's operations as a computer. But by mapping from physical to computation states, such a function provides a way of interpreting a sequence of nomologically governed physical states. In the same vein, we might suppose that every mind has some material embodiment, although minds may have very different kinds of material embodiment. In case of human beings, our brains constitute the hardware on which our mental software runs. And one of the important similarity between cognition and computation is that the explanation of how a computation proceeds must make reference to what is represented by the various states of the mind.

Machine functionalism is also committed to a distinction of ontological levels. For functionalism, a given computational operation can be realised in a variety of distinct material devices. It can be realized in vacuum tubes and wires, in a device consisting of silicon and transistors, even in a hydraulic device consisting of water filled tubes and valves. Brains and many biological systems seem capable of performing computations. But if this is so, then performing a computation cannot be a material process.

According to machine functionalists, a mental state may be realized in a variety of systems not only in the human system, but also any other system resembling it. In claiming that mental properties are not material properties, a machine functionalist is not suggesting that mental properties are immaterial properties, properties of non-material substance. The machine functionalist's point is that a higher-level property such as being in pain or computing the sum of 7 and 5 is not to be identified with or 'reduced to' or mistaken for the system that realizes it. According to Heil, functionalism is a univocal view. Machine functionalists began with a shared set of insight and convictions. Earlier, we saw that machine functionalism blossomed with the advent of computing machines. We distinguish programs and computations from the hardware that is said to realize these. We can think of minds as devices that run software on complex chunks of hardware.

Machine functionalism considers states of mind and mental properties to be functional states and properties. A state is a functional state of a particular sort only if it answers to a particular job description, that is in case it answers to a particular sort of causal role in the system to which it belongs. A property is a functional property when its possession by an object turns on that object's satisfying a particular causal role.

According to Churchland, the essential or defining feature of any type of mental state is the set of causal relations it bears to environmental effects on the body, other types of mental state and bodily behaviour. For example, pain characteristically results from bodily damage; it causes distress, annoyance and practical reasoning aimed at relief, and it causes pain blanching, and nursing of the traumatized area. It has to be made clear that a state is not a property, nor a property a state. Nevertheless, in discussing machine functionalism, it is convenient at times to

speak of properties and sometimes of states. However, D. M. Armstrong and David Lewis take mental properties to be machine functional properties, but identify these with what other functionalists would regard as their realisation. A mental state, as per Armstrong-Lewis theory, is the occupant of a particular causal role. They identify state of mind with the roles, not their occupants.

Machine functionalists have regarded identity theorists as narrow-minded reductionists, philosophers who aim at reducing the mental to the physical. The identity theorists hold that thoughts, feelings, wishes, and the like, are identical with physical states. Not 'identical' in the sense that mentalistic terms are synonymous in meaning with physicalistic terms but 'identical' in the sense that the actual event picked out by mentalistic term is one and the same event as those picked out by physicalistic term. Identity theorists as narrow-minded reductionist because identity theorists aim at reducing the mental to the physical. But, functionalism is against reductionism because functionalism is committed to a conception of the world as containing distinct and irreducible levels of properties. The higher levels are thought to be 'autonomous' with respect to lower levels. The higher levels are not reducible to, identifiable with lower levels because higher levels are supervenient on lower levels. But functionalism is anti-reductionist and so it rejects the identity theory.

Machine functionalists also reject behaviorism. According to behaviourists, to be in a particular state of mind is to respond to stimuli in a particular way. J. B. Watson is regarded as the founder of behaviourism. He says that a thought is nothing but an incipient movement of the larynx and an emotion is nothing but an internal pattern of bodily adjustment. To be in pain is to respond to certain sorts of stimuli in familiar ways or at least to be disposed to respond. Functionalism rejects the very notion of causal stimuli. It interprets mental states as functional states of the human organic system. Thus functionalists embrace this observation regarding states of mind as functional states, states characterisable by their place in complex causal stimuli. For example, pains may be characterized by reference to typical causes, their relations to other states of mind, and behaviour outputs.

4.3 MACHINE INTELLIGENCE, COMPETENCY & CREATIVITY

As already discussed, machine intelligence or artificial intelligence is a physical symbol system, which has the necessary and sufficient means for general action. The above statement shows that machine intelligence has the capacity of competence and creativity. However, the system that exhibits general intelligence will prove upon analysis to be a physical symbol system. Further the physical symbol system of sufficient size can be organized further to exhibit general intelligence. The general intelligent action indicates the same scope of intelligence as we have seen in human action. The symbol system hypothesis implies that intelligence will be realized by a universal computer. It also asserts that the intelligent machine is a symbol system. When machines acquired enough memory to make it practicable to locate actual symbol system with the help of programs produce intelligent behaviour and solve many problems.

Moreover, many machine intelligence scientists use computers as tools, to help them create things they could not have created. For example, many scientists use sounds which no orchestra could produce. A visual artist may get ideas from computer graphics. We are concerned with those programs which produce aesthetically interesting creations. There are a number of

programs which explore artistically interesting spaces, and a few which produce aesthetically acceptable results.

Boden has given the example of a famous painter, Harold Cohen. Cohen has written a series of programs which produce pleasing, and unpredictable line drawings. Cohen's programs explore a certain style of line drawing and a certain subject matter. As human artists have to know about the things they are depicting, so each of Cohen's programs needs an internal model of its subject matter. This model is not a physical object. It is a set of abstract rules, which specify not only the anatomy of the human body, but also how the various body-parts appear from various points of view.

AI or Machine intelligence programs that write stories are woefully inadequate compared with human storyteller. But the best of them get what strength they possess from their internal models of very general aspects of motivation. For example, a program is asked to write a story with the moral 'Never trust flatterers.' In this story, there are two characters, the Fox and Crow. The story as follows "Once upon a time, there was a dishonest Fox, named, Henry who lived in a cave, and a vain and trusting Crow named Joe who lived in an elm-tree. Joe had gotten a piece of cheese and was holding it in his mouth. One day, Henry walked from his cave, across the meadow to the elm-tree. He saw Joe Crow and the cheese and became hungry. He decide that he might get the cheese if Joe Crow spoke, so he told Joe that he liked his singing very much and wanted to hear him sing. Joe was very pleased with Henry and began to sing. The cheese fell out of his mouth, down to the ground. Henry picked up the cheese and told Joe Crow that he was stupid. Joe was angry, and did not trust Henry any more. Henry returned to his cave. The end (Boden 1994)."

This program can construct hierarchical plans, ascribing them to the individual characters; according to the sorts of motivation one would expect them to have. It can give one character a role in another's plan. But these roles need not be allocated randomly, but can depend on background interpersonal relations. And it can represent different sorts of communication between the characters, which constrain what follows in different ways. All these matters are represented as abstract schemata, which are used to produce the story-structure. Thus the above programs shows that machines have the capacity to produce creativity. Now the question may be raised as; whether programs have scientific discovery? According to Langley, programs designed can find a simple mathematical and classificatory relation as 'rediscovered' with the help of physical and chemical laws.

NET talk is another famous and important example of machine creativity and competence. As we know, this model's goal is successfully to negotiate the problem domain of text-to-speech transformation. NET talk took seven letter segments of text as input and mapped the target window of that input onto an output which coded for phonemes. A connectionists system is not trained but programmed. Let us raise a question: What does NET talk know? According to Clark, the Net talk does not in any sense understand what it is saying. But this is not the point. Likewise, I might learn roughly how to pronounce Chinese sequences without understanding them. Nonetheless, NET talk has gone from babble to an output which is lawfully disciplined with respect to its input. That strongly suggests that it has learnt something. The question, what? According to Lenat, automatic mathematician is a system that does not produce proofs, nor solve mathematical problems. Rather, it generates and explains mathematical ideas. Artificial machine starts with 100 very primitive mathematical concepts drawn from set theory, including sets, lists, equality and operations. These concepts are so basic that they do not even include the ideas of eliminating arithmetic. To begin with, the program does not know what an integer is, still less addition, subtraction, multiplication, and division.

Artificial machine hunches, like human hunches, are sometimes wrong. Nevertheless, it has come up with some extremely powerful notions. It produced many arithmetical concepts, including integer, square root, addition, and multiplication. It generates the fundamental theorem of number theory, though did not prove. And it suggested the interesting idea that every even number greater than two is the sum of two different primes. It has originated one major theorem which no one had ever thought of before. Here, artificial machine appears to be P-creative. According to Boden, there are two senses of creativity. One is psychological creativity (P-creativity) and the other is historical creativity (H-creativity). An idea is P-creative if the person in whose mind it arises could not have had it before; it does not matter how many times other people have already had the same idea. On the other hand, an idea is H-creative if it is P-creative and no one else has ever had it before. Thus artificial machine's creative is P-creative.

Hofstadter presented another important example. He designed a copycat; in this, a program can generate many different analogies, where contextually appropriate comparisons are favoured over inappropriate ones. It does not rely on ready-made, fixed, representations, but constructs its own representations in a context-sensitive way. Its new analogies and new perceptions develop together.

As we have seen, cognitive science tries to provide computational models of the mind, that is, computational simulations of human cognitive process. If creativity is not a computational process, it might still be possible to simulate it computationally, just as it is possible to simulate digestive process without the simulation itself being a digestive process. It might be possible to have machine models of human creative processes, even if machines themselves cannot be creative. As Dartnall says that if machines cannot be creative then I doubt there is any significant sense in which they can be intelligent, for they will never 'have minds of their own.' I do mean this in the weak sense that they will always slavishly do what we tell them, but in a strong-sense, they will never be able to generate their own ideas. And I take it as axiomatic that if they cannot generate their own ideas they cannot be intelligent.

4.4 MINDS IN MACHINES

This section will explore the states of mind in artificial intelligence. As we know the main aim of artificial intelligence is to reproduce mentality in machines. That is to say that AI aims at producing machines with mind. If we say that machines have minds, then we have to ascribe certain 'belief', 'knowledge', 'free will', 'intention', 'observations', etc. to a machine. In that case, the machines will perform intelligent tasks and thus will behave like human beings.

We may raise a question: Why should we want ascribe mental qualities to machines at all?

According to MacCarthy, there are many reasons for ascribing belief and other mental qualities:

- (i) Although we may know the program, its state at a given moment is usually not directly observable, and we can explain performance of a machine only by ascribing beliefs and goals to it.
- (ii) Ascribing beliefs may allow the derivation of general statements about the machine's behaviour that could not be obtained from any finite number of simulations.
- (iii) The difference between this program and another actual or hypothetical program may best be expressed as a difference in belief structure.

According to Haugeland, thought itself is not static and random: It develops in ways that obey different rules of inference. Haugeland says that since correct application of the rules of reason to

particular thoughts depends on what those thoughts mean, it seems that there must be some active rule-applier, which understands the thoughts (and rules), and which applies the rules to the thoughts as well as it can. If the activity of this rules applier, following the rules of reason, is to explain the rationality of our thought process, then it must be regarded as a complete little person – or homunculus (in Latin)- inside the head, directing the thoughts like a traffic cop. The trouble is: a theory that involves an homunculus to explain thinking has begged its own question, because the homunculus itself has to think, and that thinking has not been explained.

Cognitive scientists can be materialists and mentalist at the same time. They are materialist because they support the view that the mind is a complicated machines or matter. On the other hand, some support that along with mind the body exists. They can offer explanation in terms of meaning and rules following, without presupposing any unexplained homunculus. It would be peculiar to start assigning geometrical shapes and locations to the internal program routines and operation of a system. These same decisions clearly cause physical behaviour, yet no one is worried that the laws of physics are being violated. According to Haugeland, when the machine plays, it follows rules in at least two senses: it always abides by the rules of the game, and it employs various reasonable rules of thumb to select plausible moves. Though these rules are in no way laws of nature, the machine's behaviour is explained (in part) by citing them- and yet, no unexplained 'compunculus' is presupposed. Thus this explanation will necessary invoke the system's internal reasoning processes; yet it is far from easy to figure out processes that will consistently lead to the observed behavioural response. Dennett rightly says that human mind is a semantic engine, that is to say that the way human mind handles the meaning of a word or sentence, in the same way a machine handles the literal meaning of a word or a sentence. Thus Dennett's view shows that human mind is a machine like ordinary machine because both mind and machine have the same quality, the difference is only apparent.

4.5 STRONG AI & WEAK AI (REDUCTIONISM & NON-REDUCTIONISM)

As we have seen, the main thesis of AI is that the human brain is like a digital computer, and the human mind is just a computer program. It tries to prove that the relation between the programs and the computer hardware is like the relation between mind and brain. Some supporters of AI argue that we have every reason to believe that computers have intelligence. At the same time, some others argue that the computers' intelligence is limited whereas human intelligence has no limit. Nowadays computers have achieved some modest success in proving theorems, guiding missiles, sorting mail, driving assembly-line robots, diagnosing illness, predicting weather and economic events, etc. Computers receive, interpret, process, store, manipulate and use information. Thus, intelligent behaviour is programmed into the computers. On the contrary, we have no idea how the brain functions, but we have an idea of the general relationships between brain processes and mental processes. Mental processes are caused by the brain activities which are functions of the elements constituting the brain.

Strong AI argues that it is possible that one-day a computer will be invented which can function like a mind in the fullest sense of the word. In other words, it can think, reason, imagine, etc., and do all the things that we currently associate with the human minds. On the other hand, weak AI argues that computers can only simulate human mind and are not actually conscious in the same way as human minds are. According to weak AI, computers having artificial intelligence are very powerful instruments in the hands of man. Whereas Strong AI holds that computer is

not merely an instrument in the study of the mind, but that the appropriately programmed computer is really a mind in the sense that computers can think and do reasoning like the human beings. In Strong AI, the programmed computer has cognitive states, so the programs are not simple tools that allow us to test psychological explanations; rather the programs are themselves the explanations. Strong AI, according to Searle, basically claims that the appropriately programmed computer literally has cognitive states, and that the programs thereby explain human cognition.

The main aim of AI is to reproduce mentality in computational machines, and to try to prove that the functions of a machine are similar to the functions of the human mind. But the question is: Could a machine have mental states? For AI, in the words of Searle, there is nothing essentially biological about the human mind. The brain just happens to be one of an indefinitely large number of different kinds of hardware computers that could sustain the programs, which make up human intelligence. On this view, any physical system whatever that had the right program with the right inputs and outputs would have a mind in exactly the same sense that you and I have minds.

Searle is here critical of the view that any physical system that has the right program with the right inputs and outputs would have a mind in exactly the same sense that human beings have minds. The cognitive scientists believe that perhaps they can design the appropriate hardware and programs - artificial brains, and minds- that are comparable to human brains and minds. Strong artificial intelligence is a reductionist theory. Because strong AI reduces mind or mentality to physical properties. Here, the term 'reduces to' names a relation between theories. When this relation holds between a pair of theories, for example, R^1 and R^2 , then R^2 is said to be reducer of R^1 . According to Fodor, the reduction relation is transitive and asymmetrical, hence irreflexible.

Reducibility involves a good deal more than the ontological claim that things that satisfy descriptions in the vocabulary of R^1 also satisfy descriptions the vocabulary of R^2 . This condition is stronger than the ontological requirement that whatever falls under the generalizations of R^1 should also fall under those of R^2 . On this view, there is an important sense in which syntax is preserved under reduction. That is to say, reduction permits us to redescribe the events in the vocabulary of R^2 . Thus according to strong AI, mental states reduce to the computational states in the same way.

On the other hand, weak AI is non-reductionist, because this theory is not reducing the human mind in terms of machines, but it can only simulate human mind and this does not mean exact replication. The above statement shows that the weak AI view is non-reductionist. For the physicalist, life is a higher order property, which emerges out of the physical properties. However, in case of a zombie, there is an absence of consciousness. In other words, the logical possibility of a zombie world is considered as a world physically identical to our world, but conscious experiences is impossible in this world. The zombies may be psychological or phenomenal zombies, which are physically and functionally identical to human beings but they lack experiences. According to Chalmers, the logical possibility of zombies seems equally obvious to me. A zombie is just something physically identical to me but which has no conscious experience – all is dark inside.

The zombie and me have identical physical properties but differ in high-level properties like consciousness. The zombies lack consciousness. Therefore, the high-level property of being conscious cannot be logically supervenient on physical properties. In the same way, according to weak AI, mind and machines have some identical properties but differ mainly on some higher

qualities. Here, weak AI is non-reductionist because unlike strong AI, it does not reduce mind to machines.

Check Your Progress I

Note: Use the space provided for your answers.

1) What is a Computer which acts on its own when programmed?

.....

.....

.....

2) Can Computer think for itself? Explain.

.....

.....

.....

4.6 LET US SUM UP

Thus, to talk about minds and mental operations is to talk about machines and their states. If there are no functional distinctions between mind and machine, the machine has the functional capacity of creativity and competence. Because program can construct hierarchical plans, ascribing them to the individual characters, according to the sorts of motivation one would expect them to have. It can give one character a role in another's plan. NET talk is one of the famous and important examples of machine creativity and competence. If this is so, we will find out how AI scientists are explaining mind from the reductionist, point of view.

4.7 KEY WORDS

Minds, Machines, functionalism, strong AI, weak AI & creativity

4.8 FURTHER READINGS AND REFERENCES

Boden, Margaret A. "Creativity and Computers." in *Artificial Intelligence and Creativity*. Terry Darnall. Ed. London and Boston: Kluwer Academic Publishers, 1994.

Boden, Margaret A. "What Is Creativity." in *Dimensions of Creativity*. Margaret A. Boden. Ed. Cambridge: The MIT Press, 1994.

Chalmers, David J. *The Conscious Mind*. New York: Oxford University Press, 1996.

Churchland, P. M. *Matter and Consciousness*. Cambridge: The MIT Press, 1988.

Clark, Andy. "Connectionism and Cognitive Flexibility." in *Artificial Intelligence and Creativity*. Terry Darnall. Ed. London and Boston: Kluwer Academic Publishers, 1994.

Dartnall, Terry. "On Having A Mind of Your Own." in *Artificial Intelligence and Creativity*. Terry Dartnall. Ed. London and Boston: Kluwer Academic Publishers, 1994.

Fodor, J. A. *Representations: Philosophical Essay on the Foundation of Cognitive Science*. USA: The Harvester Press Limited, 1981.

Haugeland, John. "Semantic Engines: An Introduction to Mind Design." in *Mind Design: Philosophy, Psychology, Artificial Intelligence*. Ed. John Haugeland.

Heil, John. *Philosophy of Mind*. London: Routledge & Kegan Paul Ltd., 1998.

Langley, P, Simon, H. A., Bradshaw, G. L. and Zytkow, J. M. *Scientific Discovery: Computational Explorations of the Creative Processes*. USA: MIT Press, 1987; quoted by Margaret A. Boden. "Creativity and Computers." in *Artificial Intelligence and Creativity*. Terry Dartnall. Ed. London and Boston: Kluwer Academic Publishers, 1994.

McCarthy, John. "Ascribing Mental Qualities to Machines." in *Philosophical Perspective in Artificial Intelligence*. Martin Ringle. Ed. Sussex: The Harvester Press, 1979.

Newell, Allen and Simon H. A. "Computer Science as Empirical Inquiry: Symbols and Search." in *Mind Design: Philosophy, Psychology, Artificial Intelligence*. John Haugeland. Ed. Cambridge: MIT Press, 1985.

Pylyshyn, Zenon W. *Computation and Cognition: Toward a Foundation for Cognitive Science*. Cambridge: The MIT Press, 1986.

Searle, John R. *Minds, Brains and Science*. Cambridge: Harvard University Press, 1984.

Teichman, Jenny. *Philosophy and The Mind*. USA: Blackwell, 1988.