

DISSEMINATION OF KNOWLEDGE SERIES

Neurosciences and Philosophy

Some Problems in the Light of Indian
and Buddhist Philosophy

G.C. PANDE

INDIAN INSTITUTE OF ADVANCED STUDY
RASHTRAPATI NVAS, SHIMLA-171005

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Foreword

The Indian Institute of Advanced Study is wedded to the noble task of research on fundamental themes of life relevant to humanity. With this objective in view the Institute organizes intensive research by its resident fellows, lecturers and talks by eminent Visiting scholars and Visiting professors as well as by seminars, conferences, workshops at Shimla and outside through its collaborative institutes and centres. The Institute has a distinguished record of publication of books, monographs, proceedings of seminars, symposiums, etc. It publishes three journals—*Summerhill: IAS Review* and *Studies in Humanities and Social Sciences* and *Chetana* (in Hindi). These publications go a long way in achieving the aims and ideals of the Institute.

The Institute has launched a programme entitled “Dissemination of Knowledge” under which it publishes Occasional Papers on significant themes of knowledge relevant to society, nation and humanity. The paper entitled “Neuroscience and Philosophy” by Prof. G.C. Pande in this series brings into focus the developments in neuroscience and also its limitations in the ultimate research for consciousness. Neuroscience has made tremendous advances and has been used for several therapeutic treatments and has led to support an empiricist-positivist philosophy. But consciousness is something more than neural cognizance. As such it cannot be the ultimate answer in the search for consciousness. The paper rightly asserts that the idea of man in Indian as well Greek philosophy has been that of a self-consciousness being with a dual nature—rationalist and physical. Naturally from this point of view, naturalistic reductionalism is implausible.

The author has very ably asserted that normalcy cannot be defined exclusively in physiological terms. Its enunciation of the India system of Yoga with a distinctive methodology of experience is really a way for a final understanding of consciousness because the Yoga makes the quest for the human self in ultimate analysis possible. The neuroscience is incomplete without such experiential philosophies as of the Yoga of Indian tradition.

I feel it my privilege to facilitate the learned scholar for his very stimulating and refreshing paper on a theme which has become, of late, one of the hottest subjects for the scientists as well as the spiritualists. This inter-disciplinary attempt at synthesising neuroscience and Yoga is really very appropriate and rewarding.

I am sure such synthesis of science and spirituality, as this paper proposes, will be welcomed by scholars of different disciplines.

Indian Institute of Advanced Study
Shimla

V.C. SRIVASTAVA
Director

Neurosciences and Philosophy

Some Problems in the Light of Indian and Buddhist Philosophy

G.C. PANDE

It is proposed to consider some implications of cognitive neuroscience for philosophical anthropology of which there is an ancient Indian and Buddhist tradition. In particular the ancient science of *Yoga* formulates a science of the mind which is practical and testable.

1. DEVELOPMENT OF NEUROSCIENCE

Over the last quarter of the century, the development of Neuroscience has been so remarkable that there is a danger of philosophical anthropology being swept off its feet. It may be recalled that Plato advised the seeker after truth to subject the foundations of the special sciences to the criticism which he designated dialectic.¹ In a similar fashion in the Indian tradition, philosophy is conceived as the critical and reflective examination of the sciences, as their illumining lamp, as it were.² Although the search for the physical basis of human personality and behaviour has been as old as mankind, the breakthroughs which have been achieved in recent years through the development of neuroscience have produced a revolution not only in therapy, but also thrown a challenge to philosophical thinking. That many functional disorders in human behaviour may be treated by the use of drugs was known to earlier medical practice. The role of prenatal factors of food and drink and of unbalanced and conflicting mental dispositions, overt and latent, was studied in this context.³ These methods however were wholly empirical and with an uncertain degree of success.

Neuroscience enables us to move back from abnormal behaviour to its roots in the activity of the nervous system. The study of the nervous system has acquired a new depth owing to the combined efforts of physiologists, psychiatrists, biochemists, endocrinologists, micro-surgeons and the newly developed techniques of mapping and imaging the brain through x-rays (CT) and magnetic resonance (MRI). Even the relatively simple device of EEG is powerful diagnostic tool. As a result of such detailed investigations of the brain and nervous system using PET, lesioning and dying in experiments, the structures and behaviour of billions of neurons and their interconnections, exceeding the number of atoms in the universe are becoming increasingly accessible.⁴ The electrochemical changes involved in the functioning of the nervous system are being continuously researched. As a result of these advances more effective intervention of a therapeutic nature has become possible in the case of diseases like epilepsy, Alzheimer's disease, Parkinson's disease and various forms of neurosis and psychosis such as anxiety, depression or schizophrenia. Doubtless, far more remains to be done in this area, but diagnosis through an understanding of the structure and interaction of the neurons and chemical changes involved in their activity have brought us nearer to their treatment. The discovery of the role of such chemical secretions as dopamine or acetylcholine is truly a remarkable advance. Similarly significant is the discovery that there are definite patterns of 'brain waves' or electrical activity which characterize normal waking or sleep and when disordered are a fair index for the diagnosis of epileptic seizure. The treatment of mental disorders by the use of drugs which inhibit or stimulate specific types or clusters of neurons in the brain can also be assisted now by microsurgical procedures. The transplant of some brain cells is already a reality and the idea of a brain transplant is no longer a fantasy.⁵

II. TWO ASPECTS OF NEUROSCIENCE – THERAPEUTIC AND PHILOSOPHICAL

The general results of neuroscience have two aspects. On the one hand, its detailed understanding of neural processes finds application in therapy, on the other by discovering that states of consciousness have definite neural concomitants, it has advanced our knowledge of the structure of the human personality. This understanding has also tended to be utilized to support an empiricist-positivist philosophy which is in any case a hypothetical assumption of the methodology of neuroscience as an experimental science.¹

Neuronal Reductionism—is it tenable?

Attempts have been made by some scientists to work out the philosophical implications of neuroscience for humanistic philosophy. Thus, the idea of man as the neuronal man functioning in terms of neuronal activity has been advanced.⁶ It has been proposed to understand the whole gamut of human activities, appetites, feelings and thoughts, even thought-objects, in terms of neural activity. Such a reconstruction literally takes the human person to pieces and seeks to rebuild the fragments like those in a jigsaw puzzle. Different centers of the brain are connected with different activities and experiences. Selective damage to the brain leading to defective functioning has been extensively studied. For example Broca's and Wenicke's studies of aphasias are well known. So is Wilder Penfield's work on epileptics.⁷ Similarly various types of agnosias and apraxia have been researched. It is not surprising that from such results 'reductionist and connectivistic' views about human consciousness tend to be drawn. However, other results in neuroscience itself raise doubts about such suppositions. For instance it seems that even after commissurotomy, cognitive and linguistic abilities may be retained, as if the parts of the brain worked within a larger field.⁸

It may also not be overlooked that despite physiological advances, the understanding of human behaviour still has to

be in psychosomatic, and not purely somatic terms. It is a fact of experience that states of consciousness also appear to originate neural and physiological activity. Thus cognitions and creative imagination produce appropriate volition and emotions have palpable physical effect. Nor can the physical changes in emotions be identified with the psychic component of feeling.⁹ Normally we can freely remember, imagine and speak. In such cases it is the free self-consciousness of a person which uses the bodily mechanism. The discovery of the neural basis of this mechanism and of the fact that the artificial stimulation or inhibition of centers in the brain may produce diverse mental states, does not affect the originating power of consciousness, a fact accessible to introspection, though not to external observation which can only notice evidence of neural activity. It may, of course, be argued that since the stimulation of nerves produces memories, emotions, etc., and since neural activity may be observed in schizophrenic auditory hallucinations, the sense of originaive freedom in consciousness could well be illusory. This, however, is tantamount to saying that since some cognitions are found hallucinatory, all cognitions must be so. As a general rule what is immediately attested in consciousness can be considered hallucinatory only if there is a specific ground for thinking so.

III. PHILOSOPHY NOT AFFECTED BY EMPIRICAL SCIENCE

That the philosophical implications of the general results and methodological assumptions of current neuroscience have been sought to be appropriated by naturalistic or scientific humanism, is not so much because of neuroscience discoveries as because of the current vogue of naturalism. An appropriate philosophical evaluation of the situation must begin with the reflection that philosophical questions cannot be settled by empirical factual discoveries. Philosophical conclusions rest on reasoning on the basis of initial assumptions of a non-empirical character. Nor indeed can religious faith about transcendent principles or moral norms of a categorical nature be directly

affected by the scientific understanding of empirical facts. Philosophy, religion and morality start from postulates which spring from some original vision. Empiricism is itself one such basic point of view and having been adopted by experimental natural science provides guidance to it in the use of the Occam's Razor which eliminates transcendent entities from the purview of empirical investigation. As far as empirical results are concerned, this has been an advantage but when the results are to be interpreted in the context of philosophical, religious or moral relevance, it is necessary not to take empiricism for granted. This distinction between empirical and non-empirical belief has been made by competent modern as well as ancient philosophers. Thus it is well known how Kant made room for religion and morality by limiting science to empirical phenomena. Buddhist philosophers like Dignāga and Dharmakīrti similarly limit the sphere of the validity of theoretical reason to empirical phenomena. The orthodox philosophers of Mīmāṃsā too distinguish transcendent from empirical truths. The basic consideration is that while experience as sense perception is undoubtedly an original source of knowledge, it is nothing but dogmatism to assert that there is no other original source of knowledge such as pure intuition or revelation. That experience is the only source of knowledge, is itself an assertion which cannot be proved by experience alone. Quite a few philosophers have convincingly argued that empirical testability cannot be regarded as the meaning of truth.¹⁰ It may be added that it cannot be regarded as the universal criterion of truth either. It does not apply, for example, to the determination of historical truth. It will be argued below that rigorously empirical methods cannot fully comprehend human reality.

IV. THE IDEA OF MAN – SELF-CONSCIOUS BEING WITH A DUAL NATURE – RATIONAL AND PHYSICAL

From this general argument that without the addition of philosophical assumptions, the methods and results of

neuroscience would be inadequate to provide a philosophical basis for humanism, we may proceed further and examine whether our notion of man can be consistent with a naturalistic philosophy of man. At the outset it needs to be noted that the human being is a unique object of research. All other objects of scientific investigation are insentient or devoid of speech, can be known only through the effects their activity produces on human sensibility. They become objects of knowledge only when they come in contact with a human subject. Otherwise they remain in themselves, unknown *svalakṣaṇa* in Buddhist terminology, denizens of a *terra incognita*. Even animals are known only as living bodies, not selves. The human being by contrast is not only aware of himself in a way in which he cannot be observed by another but also capable of communicating his states of consciousness to others within limits. Combined with this unique character, human beings are also characterized by a puzzling duality. While men are self-conscious beings, they also identify themselves with a physical body. Man may thus be defined as a self-conscious person who claims to own a body but may also be described as identifiable with the body.¹¹ In any case for all practical purposes the person is identified by the body. The two constituents of the human person, sentient-self and insentient body are as different in nature as light and darkness', to quote the celebrated Vedantic philosopher Sāṃkarācārya.¹² It is paradoxical that the two should be found identified in experience. The most famous definitions of man in the east as well as in the west strikingly illustrate this paradoxical nature of man. The classical Indian definition of man is that he is a creature distinguished from animals by his moral discrimination or *dharma*. In other words, if man were not moral he would be an animal. The Greek definition of man as a rational animal or social animal is essentially similar because the Greek notion of reason included theoretical as well as practical reason and the social sense cannot help including the moral sense.

V. NATURALISTIC REDUCTION AND ITS IMPLAUSIBILITY

The question is, if man is a unitary being, how can he possess two radically different attributes of rationality and animality. Since a substance is defined by its essential attribute, how can man be an animal which does not have this attribute. One solution of the problem is to adopt a reductionist approach, materialistic or idealistic. For materialistic reductionism consciousness is an illusion engendered by behaviour or is simply a language-dependent construct.¹³ Rationality itself would be nothing more than the attribute of a certain kind of behaviour which is partly exemplified by animals and machines. The theory of evolution comes to the aid of naturalism by considering the gap between animal and man as a matter of degree. Animal behaviour exhibits a purposiveness which could be called elementary rationality. The development of the brain has given man the capacities of speech, memory, thought and inhibition, and thus made him a rational and social animal. Now the evolutionary argument cannot really bridge the radical qualitative gap between the Cartesian duality of thought and extension or the Vedantic distinction of the subject and the object. Nor can purposiveness itself be reduced to mechanism because it entails not merely the use of fixed means for fixed ends but the adaptation of means to self-determined ends. Indeed the self is not only value-seeking but itself a value which refuses to be subordinated to any other. In Indian philosophy the self in the ultimate analysis needs nothing else except this awareness for its self-realization. What is more, man is an individual and belongs to collectivities which too have an individual character as societies and cultures. As a thinking being, as an individual or a collective being, man has an inner or mental content and structure which cannot be reached by the study of the common structure of the brain. The person has a mind which is not only structured but individuated. Both humanism and theism agree with this Vedantic view that the person alone has value *per se*. Now value is not a thing nor the reason why it is wanted but the reason why it ought to be

wanted. If that reason were described as the balance of satisfaction over dissatisfaction sought to be maximized, it would still need to be adequate to the real nature of the self, which the empirical self necessarily seeks. All seekings are subordinate to value seeking, which has an endless and permanent character and is in effect a seeking or self-realization. Again, the artificial intelligence of machines cannot be equated with real intelligence because of its inevitable dependence on algorithmic processes.¹⁴

Idealistic Reduction not Self-contradictory

The counterpart for the naturalistic reduction is to use its Buddhist idealistic version, that the material body is itself an illusion arising from the appetitive force of consciousness just as in a dream.¹⁵ The other alternative to reductionism is dualism based on common sense that man is a compound of body and soul or mind. Their relationship, then could be conceived deterministically or on the basis of parallelism. Determinism too could be conceived deterministically or on the basis of parallelism. Determinism too could assign the leading role to the body or the mind or soul. It may be noted that unlike the self-contradictory materialistic denial for the self which denies, the idealistic reductionism is not inherently implausible.

VI. CONSCIOUSNESS, MIND AND EXPERIENCE IN
YOGIC THEORY AND PRACTICE

Now consciousness is immediately present in all experience as the subject. It cannot therefore be denied or doubted. It follows that consciousness cannot be coherently regarded as an illusion because an illusion itself belongs to a state of consciousness. How consciousness is related to experience and experience to its objects, are much debated issues. Nevertheless the prevailing supposition in the tradition of Yoga is of the irreducible primacy of consciousness. The commonly experienced dependence of consciousness on the body is not regarded as a necessary but

as adventitious fact arising out of the Karmic past or conative formations of consciousness and certain eradicable defects in it. Attaining to its innate purity consciousness is liberated from its dependence on the body. The purification of consciousness means its detachment from physical appetites and egocentric propensities. This becomes possible ultimately by viewing the bodily and mental processes as contingent and transient objects which are not the self, the self being the timeless self-consciousness presupposed in all mental states. The changing states of the mind not only intentionally refer to the objective world but are necessarily self-referent, revealing the self as the immanent subject. The external world is interiorized and represented as objects in the states of the mind and thus are apperceived by the subjective consciousness. The external event produces a sensory reflex which is followed by an image which mediated between sense and thought. The images are transformed into ideas by the use of linguistic tokens, memory and logical synthesis. This process of appropriating, synthesizing and generalizing sensory data culminates in a mental state in which the objective representation – image or idea – provides the content to self-consciousness. Without the subjectivity of consciousness the representation of objects will not be a part of experience at all. What makes experience possible is the fact that are presented to the subject as pure consciousness. The process of experience thus begins with the mental construction of images and representations out of stimuli from internal or external sources and is completed when these interiorized objects are presented to consciousness. The representations belong to the changing states of the mind in which the subject is immanent as their witnessing self who is not exhausted by the changing consciousness. In ordinary experience the transcendental subjective consciousness is merely immanent or subsumed in the changing states of the mind which, thus appear as changing states of consciousness. Although pure consciousness and the impure mind are identified in experience by a transcendental illusion and thus one speaks of changing states of consciousness just as one speaks of the body as the

self even though the body is owned by the self through a transcendental act of appropriation which the Buddhists call grasping or *upadana*. Briefly then the person has at the core of its being a timeless self-conscious subjectivity which witnesses and apperceives a changing content of mental states which it owns and which mediates between it and the world represented and constructed but it. Just as man is a compound of body and states of consciousness, so the states of consciousness are compounded of the self and the mental states. Just as the body becomes part of a person by its association with the mind, the mind as a flow of images, words and sign-constructs acquires the character of states of consciousness by being the immediate object or content of self-consciousness. The two appear identical in ordinary experience. When the self is liberated from its individualizing identification with the psychophysical complex, it can no longer be described as an individual entity. For Vedanta this universal consciousness is divine. Some Buddhist thinkers also accept the reality of an impersonal, absolute consciousness. It is the counterpart of the notion of Nature as a system of insentient, and transient, finite objects. The experiential reality of man is characterized by this bipolarity.

It is worth noticing that like the neuroscientists the Buddhist philosophers are convinced that physical and mental states are transient and contingent. They point out that observing them one cannot get hold of a unitary and permanent soul.¹⁶ The notion of the non-selfhood of the body and the mind, however, is a common Indian notion. The identity of the empirical person is constructed out of the continuity of his psycho-physical states. Unlike the neuroscientist, however, the Indian philosophers wish to get liberated from the sense of possession and identification with the empirical personality.¹⁷ Not merely the body but the mental states too belong to the non-self which belongs to natural phenomena. However, according to Yoga the very procession of the mental states contains a constant reference to a timeless consciousness or subject without which mental states of a person could not acquire the status of experience or become states of consciousness. The pure subject, however, cannot be

described in terms of any objective categories and is only known transcendently. Although the Sāṃkhya Yoga regards the mind as a causally determinate and transient natural object, it regards the mind as the product of three inseparable, extremely subtle constituents which are responsible for 'luminosity', motion and inertia. All nature is constituted by these forces but when the force of luminosity responsible for experience is predominant, the mind is produced as a sequence of momentary states. The mind makes the manifestation of consciousness or subjectivity possible. The Yoga along with Sāṃkhya and Vedānta argues that the mind should be regarded as natural and non-spiritual; a subject of scientific inquiry. But they view the real human person or self as the transcendental prius of experience not merely epistemologically but ontically and its self-realization as the ultimate value, the goal or purpose for which all nature strives.¹⁸ Yoga too like neuroscience seeks to apply its results to curing man of his mental defects but there is a difference in their methods and levels of operation. For Yoga the common individual with his ego-centric desires and aversions and identification with the body suffers from a deep existential malaise rooted in a false notion of the self. Yoga trains the mind to attain one-pointed tranquility which enables pure consciousness to see itself as distinct from the mental states and the body. This also leads to the awakening of the latent powers of the self which are manifested in paranormal experiences. The instrument of Yoga is the sustained and detached one-pointed absorption of the mind which is capable of revealing the subtle ideal essences of phenomena. The earlier or external stages of Yoga are designed to ensure that the mind is not distracted by worldly care or ambition or by the restlessness of the body or the breath. This is followed by the withdrawal of the mind from gross sensory objects and its concentration and absorption in subtle ideal essences culminating in the intuition of the self as distinct from the mind. While the external world is cognized through its sense mediated mental representations, the nature of consciousness is intuited introspectively. This intuition is different from reflective or mediated

self-awareness. It is also different from the apprehension of objects or images or conceptual cognition. The intuition of the self is not mediated by images, words or concepts.¹⁹

VII. NORMALCY CANNOT BE DEFINED SOLELY IN
PHYSIOLOGICAL TERMS – EPISTEMOLOGICAL, MORAL, SOCIAL
AND EDUCATIONAL ASPECTS

The discoveries of neuroscience tend to carry further the diagnosis of abnormalcy from overt behavioural or psychological terms to their physiological roots. Perceptible behaviour thus appears to be a surface phenomenon arising from neural causes. Since social legislation depends on the conceptual understanding of normalcy, it follows that if abnormalcy is the consequence of physiological changes, normalcy would have to be defined in terms of physiological structure and functioning. For Yoga normalcy of this kind is still subject to the illusion of the ego and its appetities. Even the so-called normal person suffers from these structural illusions and needs to be liberated from his egoistic concerns and bodily passions and attachments. Whether we have neuroscience or Yogic science in mind, in either case the concept of normalcy has two aspects of which one is the behavioural expectation from a man of unimpaired natural faculties, and the other is the norm prescribed by social expectations.²⁰ Physiological normalcy depending on physical and mental faculties, thus, is a necessary but not a sufficient condition for a man to be deemed normal for which he needs to learn and abide by social norms. Now social norms are designed not only for life but for good life.²¹ Insofar as social norms are inspired by an ideal of human life, they presuppose a philosophy of human nature which affords space for the quest of values. If normalcy were defined merely in terms of the physical underpinning of the cognitive faculties, the concept of the limitations of knowledge and of the criteria of truth will also be thereby affected. Instead of being understood in terms of the self-determination of the principle of rationality or its spontaneous

intuitive character, knowledge would have to be regarded deterministically in terms of learned and appropriate responses such as the work of a computing machine. In fact human cognitive activity would have to be regarded as structured in the nervous system. Human rationality would be a behavioural attribute and similar to what may be discovered in animals or machines which can be instinct or programming show the most intricate ingenuity to achieve predetermined goals. But human behaviour cannot be understood by the study of bees or the making of machines. If following the concept of artificial intelligence we hold rationality not to be the prerogative of human persons, truth would be reduced to pragmatic efficiency, a criterion which would be irrelevant in the sphere of moral and spiritual truth. The pragmatic criterion of truth would be applicable to empirical knowledge but the sphere of knowledge extends beyond that of empirical knowledge. It is this trans-empirical knowledge which is not accessible to the current methodology of neuroscience. Perhaps future researches would bring to light neural mechanisms which help the manifestation of such supernormal knowledge. Some Yogic traditions believe that suitable stimulations of bodily centers can produce paranormal experiences.

Again if it is believed that human action and impulses and even irrational fancies rise solely from the presence of certain chemicals in the body or from abnormal excitation of the nerves, or from the environmentally induced conditioning of reflexes, and if conscious dispositions are excluded as a causal factor, the treatment of the human will as free and with it of moral responsibility would be guilty of relying on illusory beliefs. As Kant had argued freedom is the *ratio essendi* of morality, the keystone of the structure of pure reason.²² So far determinists have only regarded the external environment of the individual as determinants have only regarded the external environment of the individual as determining his behaviour. Now it seems that the natural and interior environment of man determines his behaviour. Whether the internal structure of a man has a genetic origin or is in part the consequence of his external

environment, physical or social, in every case he would then have to be regarded as determined unwittingly by events inside the brain and nervous system for which he is not responsible as a conscious person. It has been recognized that physical health and social education play a part in shaping the mind of persons and psycho-analysts have brought out the role of irrationality in human personality. While the methods of psycho-analysts appeared to hold out a practical role for psychological insight in the cure of mental disorders, despite different theories, assumptions and procedures, they (psycho-analysts) still appeared to succeed to the age-old chair for the confessor. Now even this prop of the freedom to confess, rediscover and refashion one's personality seems to have disappeared. If both, rational and irrational behaviour are determined by the functioning of the nervous system within man without his knowing or consciousness initiative, he would be a creation of chance only. As neuroscience advances further, neuroscientists may be expected to be the doctors of mankind and the real advisors of social legislators. While this holds out hope, it must be remembered that between physiological activity and consciousness there is a difference of level such that normal conscious behaviour needs guidance at its own level. The contrary assumption of determinism and reductionism will produce a metaphysical predicament for the moral philosopher as well as a practical problem for the educationist as well as the social legislator. It may, of course, be said that the moral predicament is easily resolved by substituting metaphysical assumptions based on spiritual or rational autonomy by more realistic assumptions based upon a naturalistic and materialistic ethics. It would then be unwarranted to make a categorical distinction between moral obligation and the compulsion exercised on the individual's mind by his perception of social expectations and threats. Moral norms would not be different from prudential or legal norms. The educator again will have to take the ideal for the human person to be within the limits of what is given by his natural personality and his job would be to train the functioning of the

human person with reference to his natural faculties in the light of their known structure and possibilities at the level of nervous system rather than to evoke his spiritual potentialities by appealing to imponderable ideals. Such an education may be achievement oriented, it could not be spiritually liberating as was the ancient Indian or Asian Buddhist ideal. Nor would it conform to the ethico-spiritual ideal of humanity. A society may produce efficient soldiers as in Sparta without inculcating the sense of justice towards others, it may produce efficient industrial workers without inculcating in them the sense of contentment and non-possession, it may produce successful civil servants and politicians without the sense of compassion. The inculcation of these virtues requires an appeal to an ideal of the self which is not simply that of a natural creature compulsively driven to struggle to survive, succeed the maximize. As a matter of fact no society has so far made naturalism the architect of its social philosophy. It would be a pity if a misconstrued neuroscience were to be used to support a naturalistic humanism which would exclude spiritual value-seeking.

It is true that it has now become possible for the first time to help handicapped persons in ways unimaginable before. Not merely the physically handicapped but the mentally handicapped or disordered persons can be reached by the educator with his new knowledge of what is wrong with their inner neural structure and functioning. Recent attempts at helping sufferers from alexia provide an illustration of this.²³ However, the abnormal, or handicapped person cannot be regarded as the sole paradigm for educational purposes. Education is not primarily a process of helping the handicapped towards normalcy, but the attempt to help the normal man to realize his ideal potentialities. Nor can the social legislator achieve his task simply with the assistance of scientific knowledge. Neuroscience in its different forms might be able to help the legislator to create more realistic norms of human behaviour but norms must prescribe something which is not simply given by nature. The institutional norms of family and property, for example, need the inculcation of inhibitions which society adds

to what is given in instructive behaviour. The teaching of language interiorizes the basic modes of thought and symbolism current in a society. This process presupposes a unique capacity of consciousness, self-expressive, communicate, symbolizing. It is true that a computer may be taught the use of language but such language learning is limited and in any case requires a human programmer. It follows that human education and social regulation cannot be reduced to any deterministic process although such processes may assist the practical realization of the originitive freedom of consciousness just as tools and machines may help the human organism. The body including the brain is also like an instrument which has been structured for a purpose and purpose is a category of consciousness.

Freedom has been said to be the knowledge of necessity. By a fuller knowledge of what necessitates or determines human behaviour, psychologists and epistemologists, moralists, educators and legislators could certainly move forward towards a more scientific system of life regulation. Nevertheless regulation of behaviour is not completed without relating the actual to the ideal which is not given within empirical science. The meeting point of neuroscience and philosophy is provided by man but although the two disciplines strive to reach the same point, their approaches have a methodological divide. For neuroscience man is a living body endowed with a particularly complicated nervous system which is studied by empirical methods. For philosophy man is primarily a person or a self endowed with consciousness of which the reality is attested in reflection over experience.

VII. THE QUEST FOR THE HUMAN SELF REQUIRES A DISTINCTIVE METHODOLOGY SUCH AS YOGA

The quest for human reality is possibly the central quest of philosophy and no less important in science, though the methods of enquiry in the two are different. Philosophy starts with the self-experience of the human person, science with the

observation of his physical presence. 'Who an I' has been the principal question to which Vedānta addressed itself. The Buddha too endorsed the enquiry but advocated the negative method of excluding the non-self. These two were the leading approaches to the problem of the self in India. Philosophical enquiry was accompanied by meditational praxis and so the science of Yoga developed as the science of consciousness. The states of consciousness are as objective, transient and causally determined as the states of the body but being inherently imperceptible by sensory means they can be correlated with but not identified with the states of the brain and nervous system. Freedom, truth, goodness and other such ideal values are manifested only in consciousness for the self. The self revealed in the subjectivity of self-consciousness can neither be a fleeting object nor a deniable illusion. Such a philosophical interpretation of the nature of man is perfectly consistent with the findings of neuroscience though not with naturalistic humanism. This theory of man or a self or spirit revealed in consciousness but different from changing states of consciousness is confirmable by Yogic science which relies on introspection, intuition, inter-subjective agreement and predictable practical consequences.

NOTES

1. Plato on dialectic in *The Republic*, cf. A.E. Taylor, Plato (1960), pp. 291ff.
2. Vide *Nyāyabhāṣyavartikam on aṅvikṣiki*.
3. E.g. *Carakasamhitā Nidanasthāna*, Chap. 7 on the diagnosis of madness (*unmādanidāna*).
4. Charles F. Levinthal, *Physiological Psychology* (3rd. ed.), p. 13.
5. *Ibid.*, pp. 11-12.
6. E.g. J.P. Changeaux, *Neural Man* (Eng. Tr. 1985) quoted by Guy Bugault, in *JICPR*, Vol. VIII, 1, p. 73.
7. Levinthal, *op. cit.*, 92-3, W. Oebfuekd, *The Mystery of the Mind* (1985).
8. S. Kak, 'Devas, Mind's Agents and Neuroscience' (under pub.)
9. The celebrated James-Lauge theory was justly criticized by Cannon-Levinthal, *op. cit.*, pp. 354 ff.

10. Cf. Ayer, *Foundations of Empirical Knowledge*.
11. Cf. P.F. Strawson, *Individuals*, p. 95.
12. *Brahmasūtra bhāṣya*, upodghata.
13. Cf. Strawson, I.c.
14. Penrose, *Shadows of the Mind*.
15. Vide, e.g. Vasubandhu, *Vijñāptimatratāvinsatika*.
16. Cf. Strawson, op. cit., pp. 102-03.
17. Cf. Bugault, I.c.
18. Cf. Pringle Pattison, *The Idea of God*.
19. Vide Patañjali, *Yogasūtras with Vyāsabhāṣya*. Cf. my *Gopinatha Kaviraj*, Chap. IV.
20. Cf. Foucault, *Madness*.
21. Aristotle, *Politics*. The Indian definition of dharma speaks of *abhyūday*, worldly happiness and *niḥsreyasa*, ultimate good.
22. Kant, *Critique of Practical Reason* (tr. Beck), pp. 29, 188.