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Editor D. P. CHATTOPADHYAYA

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EXPLORATION OF A POSSIBILITY WITHIN NYĀYA THOUGHT

PANDIT BADRINATH SHUKLA

According to Nyāya thought, soul is one of the nine substances, the other eight being earth, water, fire, wind, ākāśa, space (*deśa*), time and the mind (*manas*). Soul itself is of two kinds, the *jīvātman* and the *paramātman*. The *jīvātman* is the embodied soul; it is plural, different in every different body.

Soul is distinct from the physical body, the senses, the mind (*manas*) and the life principle (*prāṇa*). It has no form, though it comes into contact with all substances which have a form, and thus becomes an agent and has experiences. Though it has contact with all substances which have a manifest form, yet, due to the power of *adṛṣṭa*, born of earlier *karma*, it experiences joy and suffering only in association with that particular body with which it becomes conjoined due to earlier *karma*. It then engages in new *karma* acquiring sin or merit depending on actions characterized by *dharma* or *adharma*. New experiences create in it new *saṁskāras* (impressions and propensities). In whatever way it acts, the mind joined to it by the force of its *adṛṣṭa* acts as its subordinate.

Such is the embodied soul, the *jīvātman*. It is characterized by nine *guṇas* (qualities/properties) which are specific to it: *buddhi* (cognition, consciousness), desire, aversion, effort, *dharma, adharma,* volition, joy and suffering. It is also characterized by five general *guṇas,* namely, number, measure, separateness, conjunction (*saṁyoga*) and disjunction (*vibhāga*), which inhere in it. It is born and reborn in various *yonis* (living forms) according to its *karma*. Only in a human body does it become aware of itself as a candidate (*adhikārin*) for *mokṣa*. In this state it is called *dehī, prāṇī* or *jīva*.

The *paramātman* is distinct from the *jīvātmans* or embodied souls; for *paramātman* is one, it is the creater of the world and the author of the Vedas. The *jīvas* who worship *paramātman* are in return bestowed with the gift of endless divine bliss. The *paramātman* impels the *jīvas* to enjoy the fruit of their *karma* and in the attainment of *mokṣa*. It, too, has nine *guṇas* which are its inherent properties: eternal knowledge, desire and effort in addition to number, measure, distinctness, conjunction and disjunction. *Paramātman* is called by names such as Īśvara, Prabhu, Bhagavāna, etc. Since *paramātman*

*The Text of a Special Lecture delivered by Acharya Pandit Badrinath Shukla in Sanskrit at the meeting of pandits organized by the Indian Council of Philosophical Research at Sarnath, Varanasi, from 30 October, 1985 to 2 November, 1985. Translated by Dr Mukund Lath, Department of History, University of Rajasthan, Jaipur.

creates, upholds and destroys the world, he is also given the three names, Brahmā, Viṣṇu and Śiva.

The body cannot have *buddhi* (cognition, consciousness) as an inherent property, because, if this were true, the experience of childhood would not be remembered in old age when the earlier body no longer exists. Moreover, *buddhi* is obviously absent in a dead body. Therefore, clearly, it is not the body that possesses *buddhi*. All other specific *guṇas* of the soul (ātman) such as desire, effort, etc. are rooted in *buddhi* (consciousness, cognition). Therefore, they, too, cannot be inherent properties of the body. Neither can it be said that *buddhi*, desire, effort, etc. are inherent properties, not of the body but of the sense-organs; because the memory of an earlier experience, which was acquired through a sense-organ, persists even after the sense-organ itself is destroyed. Moreover, if each of the sense-organs were separately endowed with *buddhi*, desire, effort and other such *guṇas*, every single body will have a multiplicity of conscious agent (*jñānīs*) pulling it in different directions and soon destroying it completely. Further, the mind, according to Nyāya, is atomic, but these *guṇas* such as consciousness, desire, etc. are not; they are thus experienced as continuous in nature. Such an experience would not be possible, if it was the mind and not the *ātman* or self which had these *guṇas* as inherent properties. Therefore, we are led to the conclusion that the *ātman* or self is a substance different from the body, the senses, and the *manas* (mind) and possesses *guṇas* such as knowledge, desire, etc. as inherent properties.

Such is the notion of the self as propounded in the standard texts of Nyāya and the Vaiśeṣika. But it cannot withstand criticism. For it can be demonstrated that within the Nyāya framework the concept of body along with that of the mind (*manas*) can effectively replace the concept of a distinct self, revealing it to be a redundant idea. This new Nyāya doctrine can be called the doctrine of *dehātmavāda*.

According to *dehātmavāda*, the concepts of *manas* and body can successfully fulfil the various purposes for which a distinct self or *ātman* has been posited. And this can be done without giving up the Nyāya framework. The living human body can replace the self as the ground in which those *guṇas* or properties, which are capable of being directly perceived, inhere. These *guṇas* are: *buddhi* (consciousness, cognition), desire, joy, suffering, revulsion and volition. The other three *guṇas* of the self, namely, *dharma* (merit) *adharma* (demerit) and *bhāvanā*[1], which are not capable of being directly perceived, can be taken as inhering in the *manas* (mind). Now it is true that in the Nyāya framework we cannot conceive of the above group of *guṇas*—*buddhi* (consciousness, cognition), desire, etc.—as specific or *viśeṣa guṇas* of the body; for such *guṇas* can arise in the body, an earthly object, only through a process such as *pāka* (maturation, evolution), a process which can result only in giving rise to newer *guṇas* that are essentially similar in nature to the earlier earthly (material) *guṇas*. The limbs of a human body are '*jaḍa*', dead material objects; they have no consciousness, and thus they cannot give rise

to radically different *guṇas* such as *buddhi*, the essence of which is consciousness. But, though we cannot conceive of *buddhi* and like *guṇas* as *specific guṇas* of the body, we can certainly conceive of them as *general* or *sāmānya guṇas* inhering in the body. This is, indeed, our move.

The *general guṇas* in the Nyāya system are such that for them to be conceived of as properties inhering in the body it is not necessary that they be emergent properties, through the process of *pāka*, of the same matter of which the body is constituted. Nor is it necessary that they be similar in character to those essentially material *guṇas* that belong to the various limbs of the body. For this reason it is possible within Nyāya to conceive of *guṇas* like *buddhi* (consciousness, cognition) as belonging to the body and as inhering in it. Just as form, according to Nyāya, inheres in a body as a general *guṇa*, so can *buddhi* and the like. The Naiyāyika cannot but allow this. The body, after all, has other *guṇas* too in his scheme such as *saṁyoga* (contact) and *viyoga* (the state of being disjoined), which inhere in it as *general guṇas*. Similarly, why can we not conceive of *buddhi* and such other *guṇas* as inhering in the body as *general guṇas*?

A question may be posed here: if *buddhi*, desire, effort and other such *guṇas* are conceived of as *guṇas* residing in a body, then why not conceive of them as *specific guṇas* rather than *general guṇas*? This, however, is patently not possible, for this will not be consistent with the very definition of a *specific guṇa*. A *specific guṇa* is defined as a *guṇa* on the basis of which one *dravya* (substance) is distinguished from another. The specificity of a *specific guṇa* has both a positive and a negative aspect. A *specific guṇa* is, by definition, present in substances which are characterized by it; but at the same time it is absent from all other substances. The *guṇa śabdatva* (sound as a property), for example, inheres in *ākāśa* as its *specific guṇa*. It is absent from all other *dravyas*, and is at the same time the *specific guṇa* which distinguishes *ākāśa* from other *dravyas*.

What we are proposing is that *guṇas* such as *buddhi* be conceived of as *general guṇas* inhering in a body as long as it lasts. They are analogous to form (*rūpa*) which, too, in Nyāya is conceived of as a body's *general guṇa*. There are other *guṇas* too, namely, conjunction (*saṁyoga*) and disjunction (*viyoga*), which in Nyāya are conceived of as inhering in the body as its *general guṇas*. *Buddhi* and the like can be similarly conceived of as inhering in a body as its *general guṇas* as long as the body endures as a living thing.

Regarding the three *guṇas*—*dharma*, *adharma* and *bhāvanā*—*dehātmavāda* holds that these inhere in the *manas*, and further that all three are *specific guṇas* of the *manas* since they distinguish *manas* from other substances.

OBJECTION. If *buddhi* and like *guṇas* are conceived of as *guṇas* inhering in a body on the analogy of *rūpa* (form), then they, too, should be directly perceptible like *rūpa*.

ANSWER. There is no rule which stipulates that any single specific sense-organ should be able to perceive all the *guṇas* inherent in a body. We find

that *rūpa* (form) is perceived by the eye, touch by the skin, smell by the nose, and taste by the tongue. Let *manas*, we say, be the organ that perceives *buddhi*. There can be no objection to this.

However, another objection can be raised here, namely, *guṇas* belonging to the body are so conceived in the Nyāya framework that they can be perceived only by outer sense-organs and not by an inner organ like the *manas*. This, indeed, is a rule. Therefore a *guṇa* like *buddhi*, which is to be grasped or perceived only by the *manas*, cannot be a *guṇa* of the body. In reply to this objection, we declare that once we have accepted *buddhi* and other such *guṇas* as 'belonging to' the body, we can certainly further stipulate that *manas*, which is the organ for grasping or perceiving these *guṇas*, can also be taken to be an 'outer' sense-organ, since it is able to perceive *guṇas* such as *buddhi* which belong to the body. The fact that *manas* is called an inner organ is merely indicative of its 'residing within' the body. Moreover, the Nyāya rule is that an outer organ is needed to perceive a *guṇa* that resides on the outside of a body. Since *guṇas* such as *buddhi* reside within the body and not on its surface, for perceiving such *guṇas* what is needed is, indeed, an internal organ such as the *manas*.

Let me explain further. The Sāṁkhya scheme divides sense-organs into two categories: (*i*) *jñānendriyas* (organs of perception) and (*ii*) *karmendriyas* (organs of action). The *manas* (mind) acts as an aid to both these categories of *indriyas*, and is thus called both a *jñānendriya* and a *karmendriya*. On this analogy, taking *buddhi* and other such *guṇas* as belonging to the body, *manas* can be conceived of as an outer and an inner sense-organ: outer because it perceives *guṇas* residing on the outside of the substances, and inner because it resides within the body and perceives 'inner' *guṇas* such as *buddhi*.

OBJECTION. If *buddhi* and other like *guṇas* are conceived of as inhering in the body like *rūpa* (form), then it should be possible for an observer to perceive them just as he can perceive the *rūpa* (form) of another's body.

This, we answer, is absurd. We can never directly perceive *buddhi* and other such *guṇas* belonging to any body. The shape and form of a body can be perceived by another, because they come into the field of the eye's vision. *Buddhi* and other such qualities reside within; hence they never come into the field of an observer's outer vision. Direct perception can result only when an object comes into the range of a sense-organ.

Another objection to our hypothesis can be this: if we assume that it is the body that possesses *buddhi*, then memory would become impossible; an old man with his old body will never be able to remember what he experienced when he was young, for he then possessed a different, young body.

This objection can be easily answered. Our theory of *dehātmavāda* holds that the experiences of a body give rise to *saṁskāras* (impressions) in the *manas*, and that *manas* continues to be the same in the young body as well as the old. It is through the *saṁskāra* residing in the *manas* that an old man can remember what he experienced when he was young. In our theory of

dehātmavāda, experience is conceived of as giving rise to *saṁskāra* which, in turn, gives rise to memory. Experience causes *saṁskāra* in the *manas* through the relation known as *svāśraya-vijātīya-saṁyoga-sambandha*: that is the relation of contact between two distinct and dissimilar objects residing in the same receptacle (*āśraya*). *Saṁskāra* then gives rise to memory in a similar manner. But the relation of the *manas* with the sense-organs or with the limbs of the body is not of the same nature as the relation between the *manas* and the body as a whole. Therefore, neither *saṁskāra* nor memory arise in the sense-organs or in the limbs of a body.

After death, the *manas* associated with the present body enters a new body which is born of the *adṛṣṭa* associated with the present body. This is possible, because the association of the *manas* with the body is a *vijātīya* association. It is for this reason that a newly born baby retains a 'memory' of its *saṁskāras* (impressions) in an earlier body, and begins suckling its mother's breasts as soon as it is born. Its experience in the earlier body had given rise to the *saṁskāra* that suckling the mother's breast is beneficial; and, therefore, in its new birth, too, the 'memory' born of the past *saṁskāra* causes it to suckle its mother's breasts.

OBJECTION. If the experience of a previous body can give rise to memory in a new and different body, then it should also be possible for the experience of one man to give rise to memory in another: what Caitra has experienced should, in this view, be remembered by Maitra.

This objection is groundless, because in the case of Caitra and Maitra the *manas* is not *identical*, whereas in the case of one body being reborn as another the *manas* continues to be the same.

OBJECTION. The present body which you have also equated with the soul engages in actions throughout its life. It cannot, however, attain the fruits of all its actions within the span of a single life time. Therefore, when it dies, some of its actions cannot but be conceived of as destroyed without giving rise to any fruit. How can the *dehātmavādin* fail to arrive at this unseemly conclusion? Further, a new body-soul begins experiencing joys and suffering from the moment of its birth. The *dehātmavādin* cannot account for this. For him these new experiences of joy and suffering must remain fruits of actions never performed.

Our answer is that the *manas* remains common to both the new and the old body. Actions performed in the older body which have not yet borne fruit reside as *saṁskāras* born of *dharma* and *adharma* (merit and demerit) in the *manas*. In the new body born of *adṛṣṭa* (created through *dharma* and *adharma*) in the older body, the same *manas* continues, and thus actions which were performed in the earlier body are enabled to bear fruit in the newer body. Our theory of *dehātmavāda* does not believe in the rule that the fruit of an action is experienced by the same person who performed the action. A belief in this rule is possible only for those who believe in a soul apart from and distinct from the body. This is an old prejudice that we must give up, though,

admittedly, it is difficult to give it up. The rule in which we *dehātmavādins* believe is this: the fruit of an action performed by a body is experienced by another body in which the same *manas* which resided in the earlier body resides. Body and mind (*manas*) in our view are two distinct entities, conjoined with each other through a contact of the *vijātīya-saṁyoga* kind in which two objects can remain in touch without losing their distinct identity.

OBJECTION. It is the body which performs permissible and impermissible actions. If such actions have no interaction with the *manas*, how can they give rise to merit or demerit in the *manas*? And if merit and demerit reside in the *manas* which is quite distinct from the body, how can a new body experience the fruits of earlier action, since the continuity of the new birth with the old is through the *manas* and not through the body?

This objection, we say, is not tenable. We hold that the actions performed by the body cause *adṛṣṭa* in the *manas* which resides in the body through the relation known as *vijātīya-saṁyoga-sambandha*. And then this *adṛṣṭa* which resides in the *manas* becomes the cause of joy and suffering in another body through the same relation.

A further objection may be raised here: the demand for economy of thought would tend to favour positing an independent self or *ātman*, because this would do away with the positing of an indirect causal relation leading from experience to *saṁskāra* to memory on the one hand, and from action to *adṛṣṭa* on the other.

The answer to this objection is as follows: when we choose between two alternative causal explanations, the principle of economy is not by itself sufficient to lead us to the right choice. The totality of what is to be explained should be the prime consideration. The question of economy of thought usually arises in respect to the *form* of definitions where the nature of what is being defined itself is not in question, i.e. all parties agree as to what it is that is being defined, and the choice is to be made only between different formulations of how it is to be characterized in words.[2] Such is not the case in the present situation. The question we have before us concerns the very basic issue as to whether experience, *saṁskāra* and memory can at all be directly related through a causal connection with *karma* and the fruits of *adṛṣṭa*. An appeal to economy of thought cannot be a relevant argument in deciding this issue. Moreover, even if we accept that experience, *saṁskāra*, memory and *adṛṣṭa* reside in the same receptacle, i.e. *ātman*, and thus they can be causally related in a direct manner without necessitating two distinct causal connections, then, too, we shall not really gain in economy; for then we will have also to accept an infinity of all-pervasive, *vibhu*, substances, namely , the *jīvātmans*, and this will lead to another kind of non-economy in thought. This we choose to avoid.

Further, the belief in *ātman* as an extra entity creates other problems. Sentences like 'I go', 'I know' necessitate a basic distinction in the analysis of the two verbs, thus resulting in another loss of economy in thought. In

explaining the first sentence 'I go', traditional Nyāya will have to take the verb 'go' as referring to an action; while the verb 'know' in the second sentence has to be taken as pertaining to the *ātman* in which knowledge resides. *Dehātmavāda* gets rid of this dichotomy. For, if we conceive of the *ātman* as indistinct from the body, both the above sentences can pertain to the same entity. Take also another pair of sentences such as 'Caitra goes' and 'Caitra knows'; the belief in *ātman* as a separate and distinct entity creates a problem in understanding these two sentences. The first sentence 'Caitra goes' may be easily construed as follows: the word 'Caitra' can be understood as referring to Caitra's body which also may be seen as the *āśraya* (ground) of the act of going. But a similar analysis cannot be made of the sentence 'Caitra knows' if we accept the *ātman* theory; because the verb 'know' will then pertain to an entity, i.e. *ātman*, which is distinct from Caitra's body. The two verbs 'go' and 'know' will thus have separate *āśrayas*. Neither can we make the move of taking the verb 'know' as pertaining not to any *āśraya* or entity that knows but to a limited piece of knowledge itself. For, then, the sentence 'God knows all' will be impossible to construe since God's knowledge is unlimited.

However, the following may be postulated by the separate *ātman* theory: the meaning of sentences like 'Caitra goes' and 'Caitra knows' are to be taken as pertaining separately to both the body and the *ātman* of Caitra. But such a move, too, will create a problem. A sentence such as 'Caitra does not know' will then not be able to contradict another statement such as 'Caitra knows', for we will be able to construe the first one as pertaining to the body of Caitra and the second one as pertaining to the *ātman*.

Another objection may be raised against *dehātmavāda* as follows: *dehātmavāda* argues that *saṁskāra* becomes a cause of memory through the fact that both memory and *saṁskāra* reside in the same receptacle (*āśraya*) and are related through a *svāśraya-vijātīya-saṁyoga-sambandha*. It is through this causal connection that memory resides in a human body in the *dehātmavāda* view. But this raises a problem, for a similar causal chain connects memory to the sense-organs too. Hence the sense-organs will also have to be understood as endowed with memory. And, since memory is a kind of knowledge, sense-organs will become identical with *ātman*.

The objection is not justified. We *dehātmavādins* think that the process through which experience gives rise to *saṁskāra* has to be construed in this way. Experience gives rise to *saṁskāra* through the *svāśraya-vijātīya-saṁyoga* relation. And *saṁskāra*, then, gives rise to memory. But this relation *does not* exist between memory and the sense-organs or the limbs of the body. (Memory resides through *manas* in the body *as a whole*, which is an entity distinct from sense-organs and the limbs of the body, which are parts of the body.)[3]

OBJECTION. In *dehātmavāda* the notion of the relation between the *manas* and the body is such that ordinary material objects such as a piece of cloth or a jar can also become associated with the mind (*manas*), and, therefore, they, too, can have *ātman*.[4]

ANSWER. The *manas*, we believe, is related to the body only through an indirect causal connection, i.e. through a causal link established through experience and memory. This is what makes the continuity of *karma* possible for the same *bodymind* entity from one life-time to another. The *manas* has no such causal link with objects like a jar or a piece of cloth. If we make relation such as 'occuring at the same time' or 'being the object of the same knowledge' as equal in status to the relation of *saṁyoga* with the same '*āśraya*' (which the *manas* has with the body) and further argue that the former two relations can also give rise to memory through *saṁskāra*, then the whole world will become the *āśraya* of knowledge and it will have to be believed that everything has an *ātman*. But such an argument is far-fetched and is no more than a vicious attempt to destroy all cogent theorizing. Even in the theory which believes in *ātman* as distinct from the body, not everything can become the *āśraya* of *ātman*. Through relations such as 'occurring together at the same time', the *ātman* can become related to objects such as jars. But this theory denies that knowledge can rise in the *ātman* through its connection with a jar. It is only through the connection of *ātman* with living bodies (which become its *āśraya* through a *vijātīya-saṁyoga*) that the rise of knowledge is possible. Similarly, *dehātmavāda* also believes that, though *manas* can have *saṁyoga* with every thing through relations such as 'occurring at the same time', yet such relations do not give rise to memory or other conscious entities. It is only when *manas* which is the *āśraya* of *saṁskāra* has a *saṁyoga* with a living body that such a *vijātīya-saṁyoga* can give rise to memory, etc. These are matters which can be very easily understood, and to cast unnecessary doubt upon them is misplaced.

But another, a more serious, objection can be brought against *dehātmavāda* by someone who argues as follows: the attempt at repudiating *ātman* and replacing it by the body and the *manas*, in effect, elevates these two to the status of the *ātman*; it does not negate the *ātman* as such.

This argument, too, is not tenable. In our theory the body is non-eternal, whereas the *manas* is eternal. If both together were to form the *ātman*, we shall have to conceive the *ātman* as having two contradictory qualities of being both eternal and non-eternal. This could give rise to ideas contrary to experience, ideas such as 'sometimes I am eternal, but sometimes I am not'. The equation of the pair, body-and-*manas* with *ātman*, is thus not tenable.

Gautama in his *Nyāyasūtra* says: 'Desire, revulsion effort, joy, suffering and *buddhi*, these are what characterizes the *ātman* (*ātmano liṅgam*).' We have accepted all these characteristics as belonging to the body alone and not the *manas*. *Manas* in our postulation is the *āśraya* only of *dharma*, *adharma* and *bhāvanā*. The function of the body and *manas* being so distinct, they cannot be equated with the *ātman* in any sense.

Here, however, is another objection: *manas*, in Nyāya, is atomic. It cannot, therefore, pervade the whole body. How then is consciousness felt to pervade the whole body? The only answer can be to accept an *ātman* which does

pervade the whole body. But this the *dehātmavādin* refuses to do. Thus, his theory cannot explain the common experience of our being able to feel the body as a whole.

OUR REPLY. The theory which conceives *ātman* as distinct from the body also has no answer to the problem. *Manas* in traditional Nyāya remains in contact with the *ātman*, but *manas* can be present only at one tiny part of the body at a single moment. And yet, by the multiplication of these moments, it gives rise in the *buddhi* to experiences that cover the whole body. The *dehātmavādin's* solution to the problem can be similar.

OBJECTION. It is a common human intuition that the *manas* is an internal organ, and also that *manas* is entirely instrumental in character. Its instrumentality is revealed by feelings such as 'Now I am doing this with my mind', 'I am aware through my mind', and the like. *Ātman*, however, is not an instrument but is considered to be an agent. *Manas*, being purely instrumental, cannot, therefore, replace it.

This objection is again easily answered. *Dehātmavāda* believes that the *body* is the *ātman* . As for *manas*, it is merely an instrument of this body-as-*ātman*. This we have already stated earlier.

A fresh objection might still arise. If what makes the body conscious is the *adṛṣṭa* which belongs to the *manas*, then it becomes difficult to see how a dead body must be necessarily devoid of consciousness; because, according to *dehātmavāda*, the *manas* containing the *adṛṣṭa* which imparts consciousness to the body continues to exist even after the death of the body with which it was associated.

This objection, too, is not tenable, the reason is that we believe in the rule (*niyama*) that the *vijātīya-saṁyoga-saṁbandha* (the contact between two categorically different objects such as *manas* and the body which makes it possible for the *manas* to be associated with the body) is destroyed immediately and necessarily at the death of the body.

Yet, the following questions may arise: if the body *is* the *ātman*, then usages like 'my body' will have to be understood in a purely metaphorical sense. But in that case, how do we explain the fact that usages such as 'I am the body' are never to be found? How can the *dehātmavādin* explain this?

ANSWER. Linguistic usages depend on our knowledge of both words and the objects they refer to. Since we never have a knowledge which can be expressed as 'I am the body', such usages are not found.

But this only raises a further question: if the body is identical with the *ātman* how then can one explain the fact that such a knowledge never arises?

This question has an easy solution. The meaning of the word 'I' can be grasped only in connection with the characteristics (*guṇas*) of which 'I' can be an appropriate *āśraya*. Therefore, the knowledge of 'I' arises only in terms of 'I am fat', 'I am thin', 'I am happy', 'I am willing', etc. The knowledge such as 'I am the body' does not arise in normal experience; but, then, neither does the knowledge such as 'I am the *ātman*'. The theory, which upholds

ātman as a separate, distinct entity, has, therefore, the problem of explaining why a knowledge such as 'I am *ātman*' is not a common human knowledge. *Ātman* in common experience is known not directly but through its properties such as *buddhi*, joy, etc. resulting in usages such as 'I know', 'I am happy' and the like.

Another objection to *dehātmavāda* can be made on the basis of Patañjali's *Yogasūtras* which speak of various *bhūmis* (aspects or stages) of the *chitta* (psyche). These *bhūmis* such as *kṣipta, vikṣipta* and others have no relation at all with the body or any limb of the body, a fact which is a matter of common experience. *Dehātmavāda* cannot account for their existence. Only the postulation of a distinct *ātman* can do so.

This objection is baseless. *Dehātmavāda*, too, can successfully comprehend and accommodate *bhūmis* of the psyche.

No one has any doubt concerning his own existence. Such doubts as 'Do I exist or Do I not?' just do not arise in anyone's mind. The doubt that does arise is whether the body is the *ātman* or not. For both *dehātmavāda* and the doctrine of a separate *ātman*, the doubt 'Do I exist or not?' will not arise. Since in the *ātman* doctrine the body is decidedly not *ātman* and in *dehātmavāda* it is decidedly so, the question 'Do I exist or not?' is meaningless and adventitious in both cases, and the belief in the existence of self either as the *ātman* or the body remains unquestioned.

What we intend to point out is that the term 'I' refers to the person who utters it. In the *ātman* theory, 'I' will refer to the *ātman* as an entity distinct from the body, implying that the person who says 'I' is an *ātman* distinct from the body. In *dehātmavāda* the same 'I' will refer to the body of the person who utters the personal pronoun. In both cases, 'I' will have a meaningful, unquestionable reference. The doubt 'Do I exist or not?' will in either case be adventitious.

OBJECTION. A statement such as 'He is reflecting on the question whether he is the body or not' will sound very strange if we accept the doctrine of *dehātmavāda*.

This, however, cannot be taken as a serious objection against *dehātmavāda*. In the doctrine of a separate *ātman*, the proposition 'I am not the body' is an unquestionable given. In *dehātmavāda*, on the other hand, what is given as unquestionable is the proposition 'I am the body'. Thus, a question such as 'Am I the body or not?' is adventitious not only for the doctrine of *dehātmavāda* but also for the *ātman* doctrine.

Another objection to *dehātmavāda* can be as follows: the experience that 'I am' seems sometimes to arise from the head and sometimes from the nerves or the flesh of the body. This in *dehātmavāda* is bound to give rise to absurd experiences such as 'I am my head, or 'I am my flesh' or 'I am my nerve'.

Such an objection can only be called crude. Experiences that arise from different limbs of the body such as the head or the flesh or the nerves actually belong to the body as a whole, which is distinct from its parts and is the real reference of the term 'I'.

YET ANOTHER OBJECTION. The 'I' experience, as we can all feel, is quite distinct from bodily experiences of pain or joy. Therefore, the 'I' experience must be grounded in something, which is quite distinct from both the body and the *manas*.

This objection is again not tenable. We do not believe in the possibility of any experience, which may be characterized as the experience of the pure 'I'; neither do those who believe in the *ātman* doctrine. For both, the meaning of 'I' refers to the person who utters the word. According to us *dehātmavādins*, this person is no different from the body, which is the actual referent of the term 'I'. We do not understand why one should unnecessarily look for another referent.

OBJECTION. In certain states of consciousness such as dreaming, the existence of outer objects including one's own body can become either doubtful, hazy or even controverted. But such a veil of doubt or negation never falls upon the existence of the *ātman*. If the body were the *ātman*, then such an experience should have been impossible in the case of the body too.

We have an answer to this objection. What happens in the above cases is not different from what happens in cases of *bhrama* (illusion), when an object is not perceived in its true character. In a dream the true character of the body as *ātman* becomes veiled by doubt. But this does not mean that we begin to perceive the body as a non-*ātman*, something which it is not, and doubt its truth in the capacity of a non-*ātman*. Such a doubt is not possible.

We believe that the body itself is the *ātman*; there is no *ātman* distinct from the body. Yet. we also grant that the body as the ground of actions and efforts is different from the body as the ground of consciousness and the like *guṇas*. In states of dream-like illusion, the perception that we have is *not* that the body is actually a different entity, namely, the *ātman*. The body is, in fact, still taken as the body. What becomes doubtful is the existence of the body as the body, not as something mistaken for the *ātman*, distinct from it.

ANOTHER OBJECTION. The *dehātmavādin* cannot but accept that the final goal of life (*parama puruṣārtha*) is the achievement of physical comfort and material happiness. Yet, we see that human beings are prepared to undergo personal sufferings for the good of others. How can this be explained in *dehātmavāda*?

ANSWER. The doctrine which believes in a distinct *ātman* also has a similar problem, because in that doctrine, too, human action is conceived of as being solely directed towards the attainment of one's own happiness and in getting rid of whatever causes unhappiness. In truth, only a few altruistic persons give up their own happiness and devote themselves to performing actions that would lead to the happiness of others. Such people will continue to exist whether we believe in *dehātmavāda* or in the *ātman* doctrine. There are men who, though they believe in the *ātman* doctrine, are yet ready to act

for the good of others giving up their own personal comforts and accepting pain in the process. Similarly, the *dehātmavādin*, too, if he is a man of sympathy, culture and discernment will devote himself to furthering the happiness of other body-souls, giving up his own happiness and accepting pain in the process. The community of *dehātmavādins* is, in fact, substantial, and among them we do find people who gladly use their wealth for the good of others, opening schools, hospitals and other such philanthropic institutions.

Some thinkers might raise a new objection. In the doctrine of *dehātmavāda*, *adṛṣṭa* and *bhāvanā* are said to belong to *manas*. Now, during the state of *suṣupti* (dreamless sleep) *manas* enters the organ called *purītat* (an organ near the heart) which is mentioned in the Upaniṣads. If this is true, then it will be impossible to explain how the body still keeps breathing during *suṣupti*. To account for this one must accept the existence of a distinct *ātman* which causes the body to keep breathing during that state, an *ātman* which is also the *āśraya* of *adṛṣṭa* and *bhāvanā*.

The objection has no real strength. We believe that the contact between *manas* and the surface of the body (*tvak*) causes consciousness (*jñāna*) which is the basis of other conscious *guṇas* such as desire, revulsion and the like. During *suṣupti* consciousness becomes dormant; and, therefore, desire, revulsion and such other *guṇas* also remain dormant. However, actions such as breathing, which are responsible for maintaining life in the body, do not depend upon consciousness. They depend on *adṛṣṭa* which does not become dormant. Even when the *manas* enters the physical organ called *purītat*, *adṛṣṭa* actively keeps up such movements in the body which are responsible for breathing as well as other such movements that are the basis of life.

ANSWER OBJECTION. The *dehātmavādin* cannot really explain all of man's actions in terms of their fruits. The actions performed by a man towards the end of his life do not give rise to results during the life time; and, therefore, such actions are bound to remain fruitless and thus meaningless if we accept the doctrine of *dehātmavāda*. Why should a man, then, engage in such actions?

ANSWER. The *dehātmavādin* believes that the fruit of a man's actions need not accrue to him alone but can accrue to others who survive him. In this manner, actions performed by a man towards the end of his life can also have their fruit. It is wrong to say that man acts only for his own good. He also acts for the good of others as is, indeed, clear from the actions of men. It cannot be said that those men, who perform actions aiming at the good of others, do so with the purpose that, if their actions are not fruitful during their own lifetime then the merit (*puṇya*) resulting from them will yield them fruit in subsequent lives (*janmāntara*). For it is seen that people, who believe that this life is all that we have and that there is no *janmāntara*, yet engage in good deeds throughout their life, the results of which are enjoyed by others.

FRESH OBJECTION. There is another argument that can establish the existence of *ātman* as distinct from the body. The argument is as follows: 'The body being an assemblage of parts is meant for the sake of another like a bed

which is a similar assemblage.' The existence of the body, according to this argument, establishes the existence of *ātman* for whose sake it is assembled. This argument cannot be answered by a mere battery of words or by subtle casuistry. Yet, we do have an answer. The objection is, in fact, neither clear nor cogent. The notion 'for the sake of another' (*parārtha*) is not a clear notion. If 'for the sake of another' means 'for the enjoyment of another distinct from itself', then it is difficult to see how the argument can prove the existence of a separate *ātman* through the example of the bed. For, even if a bed is meant for another, it is difficult to see why this 'another' should be the *ātman*. We can take this 'another' to be the body. The *ātman* doctrine, however, cannot agree to this interpretation, since it does not believe that a body can be an enjoyer. But, then, if 'for the sake of another' is taken to mean 'that which does not itself enjoy but is meant for the enjoyment of another', then, too, the argument will fail. It will not serve the purpose of the *ātman* doctrine, for it will fail to apply to the body. Because (as we believe) the body as a whole is distinct from a mere aggregate of its parts, it will not be proper to call it a mere 'assemblage'. If, in order to save the argument, we modify our argument and say 'the body is for the sake of another, for it is a created object', then, too, the argument will remain unconvincing. Any created object, which is meant 'for the sake of another', has to be a *jaḍa* object, something made up of dead matter; but the body, though admittedly a created object, is not a *jaḍa* object, and is thus not 'for the sake of another'.

ANOTHER OBJECTION. *Dehātmavāda* makes activities such as performing Vedic sacrifices pointless.

ANSWER. This is not really true. Firstly, because in our doctrine sacrifices such as *putreṣṭi*, which aim at bearing fruit in this very life, do retain a purpose. Secondly, sacrifices which are said to result in the attainment of *svarga* can also be meaningfully performed by a *dehātmavadin*, because *svarga* is said to be an object desirable for everyone; and so a *dehātmavādin*, too, can desire it and so perform sacrifices that aim at its attainment. However, it may yet be said that, according to *dehātmavāda*, *svarga* cannot really be attained since it is not attainable by a body. This is certainly true, but it does not constitute a major objection. Firstly, because sacrifices may be performed for the enhancement of one's prestige, if not for *svarga*; secondly, results of sacrifices which aim at a mundane fruit can be attainable by a body which may not always be the present body, but will still be the home of the same transmigrating *manas* in another life. Many sacrifices, moreover, are meant for the benefit of others; *dehātmavāda* quite approves of these, because, as we have said earlier, it is human nature to engage in actions which result in the good of others.

A FURTHER OBJECTION. It is not really possible to conceive of *punarjanma* (transmigration) in the *dehātmavāda* scheme.

Our answer to this is that, even in the doctrine of a distinct *ātman*, *punarjanma* is impossible to conceive of, for it presents the same problems of identity as it does in *dehātmavāda*. If all we mean by *punarjanma* is that the same

ātman comes into contact with a new body through a *vijātīya-saṁyoga* relation, thus maintaining identity through different lives, then such an identity in which the *same* person is said to be reborn is conceivable in *dehātmavāda* too, because we believe that the *manas* continues to exist after the death of the body. *Manas,* in our view, is the *āśraya* of *adṛṣṭa* through which it acquires contact with a new body and is thus reborn. The theory of *punarjanma* can, in this sense, be upheld even within our framework.

OBJECTION. The doctrine of *bandha* and *mokṣa* (of being fettered to *saṁsāra* and of liberation in *mokṣa*) becomes meaningless in *dehātmavāda*.

OUR ANSWER: *Bandha* is just another name for engaging in actions which cause *adṛṣṭa*. The *adṛṣṭa*, then, leads to results which can only be experienced in a new life through a new body. Such a conception of *bandha* is quite tenable in *dehātmavāda* too. And *mokṣa* after, all is nothing but the absence of *bandha*. We believe that a body which has not realized its own body-soul nature through yoga should be called *baddha* (fettered to the world of transmigration); for such a body continues to perform actions which result in *adṛṣṭa* leading to fruits that have to be enjoyed in a new life. But a man who has realized his body-soul nature does not engage in such actions, and is thus 'free' or 'liberated'.

FURTHER OBJECTION. *Dehātmavāda*, in fact, cannot avoid the view that after death both *baddha* (bound) and free persons are really reduced to naught without a trace; so there is no real difference between being *baddha* and being free. Why should, then, any 'body-soul' strive for the realization of truth, giving up the pursuit of palpable sensory pleasures?

Such an objection, we must say, can be brought against the theory of a distinct soul also. For, in that doctrine too, the liberated soul is no different from being totally dead or extinguished (*mṛtopama*).

OBJECTION. There appears to be no real point in positing the new doctrine of *dehātmavāda*. For all that this doctrine has to say is that an ever-continuing (*nitya*) *manas* keeps transmigrating from one body to another, bearing *adṛṣṭa* and *saṁskāra* acquired through experiences in an earlier body; that the new bodies into which this *manas* transmigrates serve merely as vehicles for remembering experiences of the older bodies and for experiencing the results of actions done through them.

ANSWER. I am sure that this much will be generally granted that our position is an improvement in terms of economy of thought on the traditional Nyāya-Vaiśeṣika doctrine, which posits an infinite numbers of all pervading (*vibhu*) souls. The doctrine of distinct and separate *ātman* has also much else that is cumbersome resulting in an unnecessary *gaurava* (multiplication of entities and relations) in thought. It, first, posits an endless array of all-pervading souls, and then is forced to conceive of infinite relations over infinite moments with infinite substances and forms into which these souls enter. Our doctrine avoids such cumbersomeness.

Moreover, the doctrine of a separate *ātman* cannot avoid taking an amoral

stance regarding human action. Since, in that view, men are determined totally by their previous *karmas* and their *adṛṣṭa*, they are powerless against exploitation and tyranny. The *ātman* doctrine does not permit men to do anything about such things, for they are not free to do so. They are not free to remove inequalities from any given social and economic set-up, nor can they fight against a cruel government indifferent to the welfare of its subjects. *Dehātmavāda* is open to the idea that new action can be undertaken by a new body-soul. No earlier *karma* is powerful enough to constrain a man to acquiesce passively in the exploitation of one man by another under the belief that this is an inevitable result of earlier *karma*. The community of *dehātmavādins* is free to engage in actions aiming at changing the present conditions and creating a more just social and economic order beneficial to them all. They are free to create a more beautiful world.

OBJECTION. This is mere wishful thinking, for *dehātmavāda* will actually encourage people to seek their own selfish ends without caring for others. Self-seeking is a common human failing; and if one is not made responsible for one's actions beyond death, then there will be no reason for a man to desist from seeking his own selfish ends without caring for the suffering and exploitation of others.

Such considerations, however, need not antagonize us towards *dehātmavāda*. The moving spirits behind selfless actions are great selfless men of the past. The prestige that is attached to their great deeds aimed at the common good, and the reverence shown to them in history books should be enough to give rise to a similar impulse in others.

Another commendable thing about *dehātmavāda* is that it can influence people to improve themselves in this very life, since improvement in an after-life is not possible. Listening to the great tales of great men, a *dehātmavādin* will be moved to try and improve himself in this very life. In the *ātman* doctrine, the temptation of postponing a good action and leaving it for another life is very strong. A man is more likely to pursue mean and selfish ends under that scheme than under *dehātmavāda*. *Dehātmavāda* is, consequently, not only more rational but also more moral.

TRANSLATOR'S NOTES

My translation is an attempt to present to the philosophically inclined English reader a non-technical version of Badrinathji's Sanskrit essay. Badrinathji was a philosopher of great originality—as this essay, I think, also evinces—but being a Navya-Naiyāyika, he assumed a knowledge of Navya-Nyāya technical vocabulary in his readers. This was natural enough, since not only Navya-Nyāya but a great deal of intellectual writing in Sanskrit assumes such a knowledge. Most disciplines in Sanskrit that touch upon philosophy—and few do not—have been using Navya-Nyāya vocabulary and techniques for the sake of a clearer articulation of concepts.

I have not tried to translate these technicalities. Attempting a closer technical translation of Badrinathji's essay would have presented hurdles which we are not yet quite able to cross. There is no satisfactory standard English version of Navya-Nyāya vocabulary and

modes of expression. And even if we were to have one, it would need years of scholarly and creative cultivation before it can become really entrenched. As it is, those who can read Navya-Nyāya in some kind of translationese, can also understand Sanskrit. Such people will discover that my English version is lacking in certain other ways, too. I have, for example, not translated a quotation or two from Navya-Nyāya texts which Badrinathji's original includes. Badrinathji assumes a close and easy familiarity with the texts he quotes. To the English reader, not familiar with the Navya-Nyāya *paramparā*, the quotations, I think, would have sounded merely scholastic, and redundant at that. Badrinathji, moreover, has no footnotes. This is a modern habit, but sometimes useful. I have resorted to it at one place (fn. 2) where I felt that what Badrinathji had to say was intended to be in a kind of parenthesis.

On the whole, however, I have tried to remain as close to the original as possible, following the steps of the argument as it moves.

Notes and References

1. *Bhāvanā* in *Nyāya* is another name for *saṁskāra*, a property of the soul that makes it possible for experience to leave its impression or traces upon the soul. The term *saṁskāra*, however, has a larger application; it applies not only to conscious *jīvas*, but also to 'dead' matter—*vega* (speed) thus is a *saṁskāra* of wind (*vāyu*). It is through *bhāvanā* that memory becomes possible. *Bhāvanā*, in turn, cannot be directly perceived, but only inferred from the fact of memory.
2. Let us take an example. The Mīmāṁsakas make the following analysis of the process of inference. Inference, they say, is a result of two discrete cognitions: (1) *Sādhyavyāpyo hetuḥ* (the *hetu*—that through which one wishes to prove, the middle term, is pervaded by the *Sādhya*—the 'cause' of the *hetu*, the major term); and (2) *hetumān pakṣaḥ* (the *pakṣa*—the locus—possesses the *hetu*). The Naiyāyikas, who disagree with the Mīmāṁsakas concerning the proper analysis of the process of inference, yet agree with them that these cognitions do arise. But they argue that it is unnecessary to accept two separate cognitions in order to characterize correctly the process of how inference is caused. A single cognition, they say, will do, namely, *Sādhyavyāpyahetumān pakṣaḥ* (the *pakṣa* possess the *hetu* which is pervaded by the *śādhya*). The Mīmāṁsaka has no quarrel with the Naiyāyika concerning the fact that such a cognition does occur; he differs as to its relevance to a proper analysis of how inference arises.

   The Naiyāyika analysis, we say, is to be preferred, because it has the virtue of 'economy' (*lāghava*). Naiyāyikas further argue that their acceptance of a single cognition as the cause of inference has another virtue. Recognizing two *separate* cognitions as necessary for the rise of inference can result in a problem. Inferences arise in human beings. If we grant the necessity of two separate cognitions for it to arise, then our analysis will not be able to negate cases where two *different* persons might each have *one* of these cognitions. In order to avoid this difficulty, the *Mīmāṁsaka* might make the move of inserting a further stipulation in his analysis, namely, 'The two cognitions necessary for inference to rise must be possessed by the same person.' This will only result in further cumbrousness in his analysis. For it will then become necessary to make a *separate* causal analysis for each different case of the occurrence of the *same* inference.

   A similar problem occurs in the analysis of *śābdabodha* (understanding language). All Naiyāyikas agree that for *śābdabodha* to occur a knowledge of *yogyatā* is a necessary condition. *Yogyatā* is a kind of existential constraint and must be observed in using language: thus a usage such as 'wets with fire' lacks *yogyatā*, for 'wetting' and 'with fire' do not, in fact, go together, and this *fact* renders the sentence meaningless. Any philosopher defining *śābdabodha* must be careful to include the knowledge of *yogyatā* as one of the necessary factors within the body of the definition itself. Otherwise the same kind of difficulty that we spoke of earlier in connection with defining how inference arises will pose a hurdle: the knowledge of *yogyatā* in one man, will not be able in our definition to prevent the rise of *śābdabodha* in another. The definition will become cumbersome.
3. The parenthesis is to make the point clear. It is not part of the original.
4. This objection perhaps needs a clarification. In the *dehātmavāda* view, the body is a material substance and *guṇas* such as *buddhi*, desire, effort and the like, inhere in it as *general guṇas*. Badrinathji likens these *general guṇas* to *guṇas* such as form (*rūpa*). The *manas* becomes associated with *buddhi*, desire, effort and such *general guṇas* indirectly, through its association with the body. The *general guṇas* of the body are destroyed with the body. The *manas* which is a category apart, is not destroyed and becomes attached to another body. The problem with this view which Badrinathji anticipates in this objection can be stated in terms of two related questions. One, since the *general guṇas* are so conceived that any material substance can have them, how is it that only a human body has them? And two, since the *manas* becomes associated with the *general guṇas* only through its association with a material substance, why is it that such an association takes place only in the human body and not in other material substances such as a jar or a piece of cloth.

In search of a theory of truth in Nyāya*

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I

The problem of truth occupies a central position in western philosophy. Invalidity in logic is taken as a property of an argument with true premises and a false conclusion. Again, though philosophers do not agree in respect of the total set of necessary and sufficient conditions for knowledge, it is accepted by all that knowledge involves truth as an essential feature. But what is truth? The familiar theories include the correspondence theory, the coherence theory and the pragmatic theory. We were taught in our college days that the first theory offered the best explanation about the nature of truth but not about the test of truth, while the second theory offered the best explanation regarding the test of truth but failed as a theory of the nature of truth. Some philosophers hold that it is only the correspondence theory which can be accepted as a theory of truth, while the other two theories may have some value as theories of knowledge. Thus, in *Human knowledge: Its Scope and Limits* (1948), Bertrand Russell writes:

> The coherence theory and the instrumentalist theory are habitually set forth by their advocates as theories of *truth*. As such they are open to certain objections I have urged elsewhere. I am considering them now, not as theories of *truth*, but as theories of knowledge. In this form there is more to be said for them. (p. 173)

In a more recent book entitled *Knowledge* (1974), Keith Lehrer, who accepts the classical definition of knowledge as justified true belief after adding a fourth condition for circumventing the Gettier-like problems, has devoted a complete chapter entitled 'Truth and Knowledge'. He sketches therein the transition from Ramsey to Tarski, and develops a version of the semantic theory of truth which he calls the elimination theory of truth. According to him, the correspondence theory or the coherence theory is not really a theory of truth but is only a theory of justification. He thus writes:

> The thesis that underlies this particular theory (the correspondence theory) of truth is not a theory of truth at all but one of verification... The thesis is not one about truth, but about how we find out or come to know the

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truth. It is a theory about how we justify belief and claims to knowledge. When the correspondence theory of truth is understood as a genuine theory of truth, it reduces to the elimination theory, and when it does not reduce to such a theory, then it is not a genuine theory of truth at all, but a disguised theory of epistemic justification. (pp. 44-5)

Lehrer further comments:

Again, the coherence theory has often been a disguised form of a theory of how we determine that a sentence is true or *justify* the claim to know that it is true. The epistemological theory [which we shall investigate in a later chapter] maintains that claims to know that a sentence is true are justified, not by appeal to observation, but by appeal to other sentences with which the sentence in question coheres. As such, the coherence theory is not a theory of truth at all but a theory of justification. (p. 47)

If Russell and Lehrer are right in thinking that many philosophers have offered theories, which are really about *knowledge* or about *justification*, as theories about *truth*, then we shall have to presume that such a confusion became possible because there is an intimate connection between knowledge, truth and justification. It speaks highly of the philosophers of the Western tradition that they are trying to disentangle the concepts involved and thereby are trying to clarify them. If we turn to our tradition, we find that several similar concepts, which, though distinguishable and have indeed been distinguished from one another by some philosophers, have all been presupposed in the concept of *prāmāṇya/pramātva*. This will be borne out by the fact that we often use the Sanskrit terms '*pramāṇa*' (when the compound is taken as derived from '*pra*', '*mā*' and '*bhave anat*') and its synonym '*pramā*' as equivalent to 'knowledge' as is evident from the fact that the words are contrasted with '*bhrama*', while we also use the terms '*pramātva*' and '*prāmāṇya*' as equivalent to 'truth'. But if knowledge is different from truth and justification, though it may involve both, the abstract noun '*pramātva*' formed from '*pramā*' and, for that reason, also the abstract noun '*prāmāṇya*' formed from '*pramāṇa*' understood in the sense noted here need not necessarily be understood in the sense of truth only to the exclusion of justification. Therefore, it may be the case that views on *pramātva* and *prāmāṇya* may partly be interpreted as constituting what may be called a theory of justification and again as constituting a definition of truth. My aim in this paper is to present a Nyāya theory of justification as well as a Nyāya definition of truth by interpreting some of the views of some eminent Nyāya philosophers regarding the concerned concepts.

II

J. N. Mohanty begins the introductory chapter 'Introduction' of his book entitled *Gaṅgeśa's Theory of Truth* with the following words:

The purpose of this introductory study is to clarify the concept of truth in Indian Philosophy, especially in the Mimaṁsa and the Nyāya systems, and also to attempt a critical appraisal of the *prāmāṇya* theories. (p. 1)

He later distinguishes between two senses of *prāmāṇya* and writes:

'The word '*prāmāṇya*' may mean either the property of being instrumental in bringing about true knowledge (*pramākaraṇatva*), or simply the truth of a knowledge (*pramātva*)'. (p. 2)

Mohanty is perhaps using the word 'knowledge' here as occurring in his compound word 'true knowledge' in a wider sense. But, using the term 'belief' for his 'knowledge', we can understand his statement also as asserting that a belief is a case of *pramā*, if (*a*) the belief is true and (*b*) is such that it is due to the operation of an accredited source or instrument of knowledge. Some philosophers may, however, hold that all cases of true belief including lucky guesses are also cases of belief that are due to some accredited source of knowledge or other; and they may further argue that, as about such cases of belief both the conditions are held to be true, such beliefs should be regarded as cases of *pramā*.[1] But the important question that we should ask here is: if a belief is true, is it really due to one of the sources of knowledge? Again, is it also the case that, if some such source is at work in respect of origin of a belief, the belief will necessarily be true? If the answer is in the affirmative to both the questions, then, on philosophical considerations, there is nothing to be decided in the matter of whether a given true belief is also due to an accredited source, or in the matter of whether a belief which is actually due to an accredited source is also true. For, given that the affirmative answers to the questions are acceptable, it will become a matter not of a philosophical deliberation but only of empirical enquiry for finding out how many different possible types of sources we should admit in respect of origin of true beliefs under different circumstances, and also for finding out which one of such types can be meaningfully said to be involved in the generation of belief in a given case. Thus, the theory of sources of knowledge may be interpreted by some in such a manner that, if a source is admitted as operating in a given case, then the belief generated by it cannot but be true. In a sense then, the theory can never be falsified by showing that a source of knowledge is operative and the belief generated is not true, or again by showing that a belief is true but it is not due to the operation of any one of the sources admitted in the theory.[2] But if the so-called source of knowledge is understood, as it should be, simply as a causal condition necessary for the origin of the belief, then there will be no guarantee that the equivalence proposition presupposed in this theory will be true. What follows will substantiate this claim.

Presupposing that belief involves certainty and also that knowledge must involve truth, we may regard the role played by a source of knowledge as

representing the presence of a third factor different from certainty and truth. If we are permitted to treat the expressions 'source of knowledge', '*pramāṇa*' and 'evidence' as more or less the same, then we can easily show the presence of such a third factor by reference to a few cases. We shall argue below for the position that, though the factors are intimately connected with one another, it need not always be the case that evidence and truth should of necessity go together, thereby showing the equivalence proposition to be untenable.

In an inference with a true conclusion about which the person claiming inferential knowledge is certain, some proof is involved that justifies the transition from the premises to the conclusion. Similarly, in the case of knowledge by testimony the third factor is the statement by a person believed to be reliable, and that is why the statement is called a testimony and is regarded as the evidence for the belief in what is stated. This third factor is normally taken to be associated with the other two factors, viz. certainty and truth. But we come across cases where there are certainty and truth but not the third factor of the kind noted above, for example, in the case of a dream that has come to be true or in the case of conviction on the part of a gambler that all of his three unseen cards are only three aces when they are actually so. I may have evidence and truth but not certainty, for example, in the context of a sound argument with a true conclusion which has been blocked by a counter-argument or a *satpratipakṣa* that I have not yet been able to refute. Let us grant that sound is non-eternal, and I have come to believe in the proposition on the basis of the argument:

> Sound is non-eternal, because sound is perceptible with the help of an external sense-organ and also is such that something or other inheres in it.

But though my argument is not subject to any defect, I shall fail to stick to my conviction if somebody offers the following counter-argument:

> Sound is eternal, because sound is audible

The opponent can illustrate the general rule (of *vyāpti*) presupposed in the counter-argument by reference to the universal of soundhood. But I cannot come up with an example that will disconfirm the general rule to the satisfaction of my opponent, since what I can offer as a counter-example is nothing other than sound which is taken to be eternal by him. Thus, truth and evidence go with lack of certainty in this example, while certainty and truth go with lack of evidence in the preceding example of the gambler's conviction. And if the three conditions are not thus related in a necessary manner, there may certainly be cases of certainty and evidence but not truth, for example, when I come to believe something on the basis of a statement of a person who himself is mistaken about what is stated by him. Furthermore, it is conceivable that I may have certainty, truth and evidence, but not knowledge. For illustrating such a combination I shall refer to an argument believed by

Praśastāpada as involving the defect of unestablished reason of the variety he calls *tadbhāvāsiddha* (*Praśastapādabhāṣya* with *Nyāyakandalī*, pp. 577-78).

> Somebody mistaking steam for smoke argues:
>
> The hill has fire,
> because it has smoke.

When fully expanded the argument runs:

(1) The hill has fire,
(2) because it has smoke.
(3) Everything that has smoke has also fire, e.g. a kitchen.
(4) Like the kitchen, the hill has smoke.
(5) Therefore, the hill has fire.

Regarding the third argument-constituent, the arguer has both certainty and also truth, inasmuch as the truth of the general proposition and its illustration is a tested fact. The man has certainty of belief in respect of smoke's being in the hill, though it is unfortunate that he has mistaken steam for smoke. The steam that has been mistaken for smoke is perhaps coming out of a very hot spring, and let us suppose that there was really no smoke in the hill at that time. If this is the case, what he believes is not true, and absence of smoke could have been noticed by him as it gets noticed by others. Therefore, if we go by Udayana's scheme[3], we can very well regard this as a case of *svarūpāsiddha* (or that variety of unestablished reason where the reason is absent in the inferential subject). But let us imagine, as Gaṅgeśa envisages at several places of his work,[4] that there is actually smoke in the hill. Thus, though it is a fact that the man has mistaken steam for smoke, he could have avoided the mistake; and, if he were lucky enough to come across real smoke that is there in the hill, he could have the same belief in respect of the real smoke. And, in such a case, the conclusion is not only true but is also based on true premises. But let us suppose that this is not a case of knowledge. It would then imply that, though evidence generates certainty, it only seems to assure truth and does not always ensure it. That is, there is no guarantee that it will always succeed in doing so. It follows then that the three conditions are independent of one another.

We have tried to argue for the untenability of the contention that *pramāṇa* or evidence is truth-ensuring, as it cannot be said to be based on facts and sound reasoning. The examples that we have cited should certainly be regarded as disturbing cases seriously challenging the truth of the hypothesis under consideration. Even Gaṅgeśa, one of the most gifted of the *pramāṇa* theorists of our country, oscillated between accepting and not accepting some of these disturbing cases as cases of knowledge. If these are really accepted as cases of knowledge, the motivation and the strategy would be simply

to stick to the position that evidence is truth-ensuring, and to defend, in respect of these cases, that truth of the concerned belief is not a matter of accident, but is the outcome of the evidence involved. But strategy is not always considered as justification, and it is better to treat evidence and truth as independent of one another. But, though they are independent and evidence is not always truth-ensuring, it should nevertheless be admitted that *evidence and truth have been found to go together in many cases.*[5] Therefore, if there is evidence in a given case, for example, when I believe that something is the case on the basis of an argument or testimony, I am inclined to believe that, that actually is the case. And if I can ascertain that what is believed is actually true by employing some test, then I shall understand that believing in that state of affair was not all an isolated matter but was, in fact, the result of that evidence. If we are permitted to use 'evidence', understood in this sense of truth-conducive but not truth-ensuring condition, as equivalent to '*pramāṇa*', the *pramāṇa* theory can be retained if understood in a weaker sense as asserting:

(1) Given that some *pramāṇa* or evidence is operative in giving rise to a belief about an object; and
(2) Also given that the person acts on the basis of his belief and succeeds in his activity; then
(3) The evidence should be construed as giving rise to a true belief (which should, therefore, be regarded as a case of knowledge).

The above principle is, in fact, a free rendering of the beginning sentence of Vātsyāyana's commentary on the *Nyāyasūtras*. The sentence runs as follows:

(1) *Pramāṇato'arthapratipattau*
(2) *Pravṛttisāmarthyād*
(3) *Arthavat pramāṇam*

I am aware that Vātsyāyana's statement can be given a different interpretation, and also that some commentators have actually interpreted it differently. But, to those who know Sanskrit and have an open mind in the matter, my rendering, I hope, will not appear unfaithful. If it is, thus, justified to offer the weaker version of the *pramāṇa* theory sketched above, then it can no more be maintained that a given belief is true, because it is due to the operation of an instrument of knowledge. How, then, can we determine that a given belief is true?

III

In respect of things that we like to acquire or avoid our belief can be said to be true if the activity prompted by that belief is successful, and not true if the activity does not lead to the desired result. But this cannot evidently be the rule in respect of our belief about everything, for all beliefs are not associated with activities for acquiring or avoiding things. For such beliefs we can generally stipulate a negative condition to the effect that no belief can be regarded to be true if it is inconsistent with what has already been established as true.

Gautama admits three varieties of discourse (*kathā*), the first of which is *vāda* or dispassionate discussion. It involves consideration of two positions, each one of which figures as the proposition to be proved in a full-fledged five-membered argument called *nyāya*. This consideration is a form of deliberation in which one of the positions is accepted after offering a solid defence in respect of each of the constituents of the argument presented in support of it, and also after refuting convincingly the opposite position by exposing the weakness of one or more of the constituents of the counter-argument. Gautama stipulates (*Nyāyasūtra* 1.2.1) that, in the matter of such a defence and refutation, it is not only necessary that appropriate sources of knowledge and the process of hypothetical reasoning (*tarka*) be at work; but it is also essential that the *position accepted must not be inconsistent with tenets already admitted.*[6] About the nature of a tenet, Gautama holds that it is the firm acceptance of a position proved on the basis of already established positions, and is something that fits well in a system of mutually consistent beliefs.[7] It is well known that, according to him, no disputant should deviate from a tenet; and if he does, he will be guilty of the charge of *apasiddhānta*.[8] Gautama further maintains that the conclusion of an argument should be such that it is not contradicted by perception, testimony or by any sound argument. If the condition is violated, the argument will be regarded as involving the defect of *kālātita*[9] or mistimed reason, the defect which later came to be known as contradicted (*bādhita*) reason. All these points unmistakably suggest that, according to Gautama, inconsistency invalidates the claim of a belief for truth at least in the context of a debate, though he does not maintain that positive coherence is an adequate test for truth. May this be said to be true of beliefs in perceptual contexts?

Perception is a primary mode of belief, and inconsistency cannot be taken as an invalidating condition. But this does not imply that perception is self-certifying, for perception can be erroneous. If a belief about an object prompts an activity for acquiring the object, the belief, even though it is perceptual, will be false if the activity it prompts is unsuccessful. Though this has the appearance of a pragmatic test, the underlying presupposition is actually coherence or the lack of coherence between the belief that started the activity and the beliefs the agent came to acquire after the activity was over. The question may, however, be asked whether this is the picture of all kinds of perceptual beliefs.

The Naiyāyikas admit certain qualities of the soul as directly accessible. And they further hold that it is not necessary on our part to cite any further evidence than our awareness of these qualities for taking this awareness as

trustworthy in respect of the existence of these qualities. In commentarial literature on Vātsyāyana's *Bhāṣya* and also in independent works, the later Naiyāyikas usually put forward the thesis that we become immediately aware of such qualities on the basis of a sort of direct cognition in respect of the origin of which no external sense-organ can be said to be operative. In his introductory comments before introducing Gautama's aphorisms on *manas* (*Nyāyasūtra* 1.2.16) and also in his comments on the aphorism on perception (*Nyāyasūtra* 1.1.4) as well as on the aphorism *Niyamaśca niranumānaḥ*[10] (*Nyāyasūtra* 3.1.18), Vātsyāyana has put forward the thesis that we do have direct awareness of 'pleasure and other qualities (*sukhādi*)',[11] and that *manas* acts in the role of a sense-organ in respect of such an awareness.

The theory about the role of *manas* that Gautama and Vātsyāyana have advanced is roughly this: *manas* which is conceived as a partless eternal mobile substance with atomic magnitude is something which, when in contact with a given sense-organ, accounts for the fact that we can have awareness with the help of that sense-organ at a given time, though the normal conditions for perception by other sense-organs except their contact with *manas* do obtain then. So conceived *manas* acts in the role of attention. But the self-same *manas* has been conceived, perhaps on grounds of parsimony, to perform some other functions as well. It is an undeniable fact that we have an experience of unity of consciousness which Vātsyāyana calls *pratisandhāna*,[12] and which we normally express in a form like: 'I who touched the thing before am now seeing it.'[13] In respect of such an experience which is direct and immediate in nature we should admit the role of a sense. But since, in respect of the experience cited, the tactile sense-organ cannot be said to be operative now, and since the visual sense-organ cannot be said to account for the recognitive element involved here, the sense-organ involved in the experience of the unity of consciousness must not be any of the external sense-organs. For reasons of parsimony, *manas*, which is primarily the principle of attention, is conceived as a sense-organ capable of giving us awareness of all sorts of objects in such contexts.[14] *Manas* is further assigned the role of acting as a sense-organ in respect of awareness of cognitive states and also in respect of direct awareness of non-cognitive internal states, which can be conceived as not involving experience of the unity of consciousness of the kind noted above.

In respect of our experience of (*i*) the unity of consciousness, (*ii*) the fact of awareness of an object, (*iii*) the fact of absence of awareness of an object, and (*iv*) qualities of pleasure, pain, desire, aversion and volition, our belief is apparently self-certifying; and no further test is necessary for validating what we believe to be true in such contexts. Such self-certifying beliefs are restricted to the realm of things that are accessible to the subject and not to others. But in respect of our beliefs about external objects, which we form on the basis of the report of the senses or on the basis of inference or testimony, we depend on the lack of inconsistency and on some form of corroboration and perhaps also on some form of positive coherence. This implies that these

objects are publicly observable objects. Hence, if I fail to resolve any doubt regarding my belief about such an object all by myself, I shall try to ascertain what others think in the matter. Doubts can be permitted, only if they are considered resolvable with the help of the tools that are available to me or to others; and the justification need not necessarily be autobiographical. It is often a matter of social certification,and purely sceptical doubts that cannot be resolved even by the fellow-members of the society are not to be taken seriously. This view has been clearly presupposed in Gautama's theory regarding determination of truth (*tattvanirṇaya*) in *vāda* type of discussion, and, I would add, also in respect of other types of knowledge of public objects. What variety of a theory of justification can we then attribute to the Nyāya philosophers?

The relation of justification in epistemological contexts is such that what is being justified is necessarily a belief held to be true, and the other term of the relation of justification which is called justifier must also be something cognitive in nature. Justification is thus conceived to be a thoroughly cognitive relationship, both the terms of which must be cognitive states. Given this conception of epistemic justification, like the justified the justifiers also are beliefs or cognitive states of a similar nature. The *canons of evidential support*,[15] formulated in Nyāya in respect of the different types of *parokṣa* or mediate knowledge, are such that the supported and the supporting are all cases of belief. Therefore, though in the official *pramāṇa* theory of Nyāya the *pramāṇa* relationship has been conceived as a sort of causal relationship, we can trace a kind of correspondence in the realm of mediate knowledge between *pramāṇa* relationship and the relation of justification. In the face of doubt regarding the truth of the proposition claimed to be known, the courses that we may follow for removing the doubt may be more than one. Thus, if the belief prompts an activity on the part of the subject, its success will lend support to the claim for knowledge. Again, lack of inconsistency between the proposition claimed to be known and other propositions already enjoying the status of tenets of the system of knowledge lends a negative support to my belief in the sense that I am not required to withhold my belief which I would have done in the case of any inconsistency. Furthermore, if I have knowledge regarding the *system* of canons of evidential support, and if I can be sure that the evidential support in respect of the proposition claimed to be known is really in conformity with such an established canon, my belief in the truth of the proposition will be sustained. But all these points will perhaps be accepted by both the coherentist and the foundationalist. They are thus label-neutral, and we shall have to shift our attention to perceptual knowledge for the purpose of tagging a label to Nyāya.

In most of the cases what figures as the second term of the relation of justification may itself act as the justifier in another case. There may thus be a demand for a class of justifiers, which act only as justifiers and not as the second term of the relation of justification. Such justifiers are often called self-justi-

fiers, and they are regarded as foundational in character. They are so regarded because of the fact that, unlike the non-self-justifier which may be false in spite of being justified by others since justification is not conceived as truth-ensuring in such a realm, the self-justification involved in respect of initial justifiers leaves no gap between justification and truth; hence, this justification is not only truth-conducive but also truth-ensuring. Even scepticism is so fashioned that sceptical doubts are not considered possible in respct of them. Nyāya is not certainly foundationalism of such a variety, for, though certain beliefs regarding internal states as have been recorded earlier are taken to be self-certifying,[16] they are not assigned the status of justifiers in respect of our perceptual beliefs about external objects. The *pramāṇa* relationship in the realm of perceptual beliefs is conceived in such a manner in Nyāya that, though the second term of this relationship is a belief, its first term is an item of the outer world and the relationship is causal in nature. Perception is for that reason the point of entry into reality, and perceptual beliefs are thus basic in relation to discursive knowledge. But, though they are *basic* in the sense that they act as justifiers without being involved as the second term in any specific relationship of epistemic justification, there is a possibility of error and, therefore, also of doubt. Hence there is definitely the need of certification by the processes enlisted earlier. Such processes of certification in respect of *basic* beliefs are clearly anti-foundationalist in character. And, if these are considered consistent with the tenets of coherentism, Nyāya theory may be regarded as a form of coherentism.

IV

I shall now turn to the question of definition of truth in Nyāya. As I have mentioned earlier in Section II (Note 2), definitions of truth were offered in Nyāya without involving reference to the set of necessary and sufficient causal conditions in respect of a true belief. The components *tattva* and *yathārtha* (in compounds *tattvajñāna* and *yathārthajñāna*), which roughly correspond to the concept of correspondence, have often been interpreted as clues to a definition of truth. But Gaṅgeśa does not accept that truth can be defined with the help of the concept of *tattva* or *yathārtha*. I quote below a passage from the *Pratyakṣakhaṇḍa* of Gaṅgeśa's *Tattvacintāmaṇi* (Tirupati edn., pp. 419-20) wherein he examines and rejects a few definitions of *pramātva*:

(1) *Nāpi yathārthānubhavatvam. Jñāne ghaṭatvādinā 'yatha'śabdārthasādṛśyābhāvāt.*
(2) *Na ca gunajanyānubhavatvam doṣābhāva-janyānubhavatvaṃ vā. Tayorananugatatvāt pramānirūpyatyāt ca.*
(3) *Nāpi samvādyanubhavatvam. Jñānāntareṇa tathollikhyamānatvasya samvāditvasya bhramasādhāraṇatvāt.*
(4) *Nāpi abādhitānubhavatvam. Bādhasya viparītapramātvāt.*

(5) *Nāpi samarthapravṛttijanakānubhavatvam. Upekṣāpramāyamavyāpteḥ. Tadyogyatāyāḥ pramānirūpyatvāt.*
(6) *Nāpi tattvānubhavatvam. Avastuno abhānāt. Bhāne vā bhramasādhāraṇyat.*

We are offering below a very brief but free rendering of the definitions as well as of Gaṅgeśa's critical comments about the definitions.[17]

Definition 1
One may define a true belief as:

A belief is true, if and only if the belief is *like* the object.

The definition presupposes that there can be similarity between a belief and its object. It is evident from the use of the word 'like'. The relevant Sanskrit word is '*yathā*', and its meaning is to be guessed from what is stated by the word in '*yathā* (as) *arthaḥ* (the object), *tathā* (so is) *anubhavaḥ* (the belief)'.

It is, however, difficult to trace similarity in respect of any objective property between a belief and its content, both of which belong mostly to different realms of reality. And even if there is any such property, similarity in respect of such a property which is bound to be very general in nature can be said to obtain even between a false belief and its content. Hence the definition is not acceptable.

Definition 2
The second definition states:

(*a*) A belief is true, if and only if it owes its origin to a set of causal antecedents which include conditions having *guṇa* or good quality; or
(*b*) A belief is true, if and only if it owes its origin to a set of causal antecedents that does not include any defective condition.

The first of this set of two definitions utilizes the concept of *guṇa* or quality and the second one that of defect or *doṣa*. But none of the concepts of *guṇa* and *doṣa* can be said to have any uniform meaning traceable to a generic shareable property, and thus cannot be understood without reference to the concepts of true belief and false belief; hence the definitions will involve the defect of circularity. Causal conditions that are described as defects or as something of the opposite character fall under diverse ontological types, and, therefore, they cannot be defined by reference to common objective properties. Hence no general non-circular definition of truth can be offered by utilizing such concepts.

Definition 3
The third definition is as follows:

A belief is true, if and only if it concurs with other beliefs.

The word 'concurs' (which I take to be the equivalent of the Sanskrit word '*samvadi*' may be taken to represent a relation between two cognitions, which have completely identical contents or have only some contents in common. On the former hypothesis, the definition becomes absolutely pointless. On the latter hypothesis, there can be partial concurrence even between a false belief and other beliefs, and this will provide a clear counter-example. Thus, the false belief that the mango is hard and white has partial concurrence with the true belief that the mango is hard and green, though the first belief is erroneous in respect of colour.

Definition 4
The fourth definition is:

A belief is true, if and only if it is uncontradicted by any other belief.

This definition presupposes that a false belief is a contradicted belief. But the mere relation of opposition which is surely involved in the concept of contradiction, is symmetric in nature; if the contradicting experience is not taken to be true and thus not regarded as contradicted, the contradicted belief cannot be regarded as false. Therefore, the idea of uncontradictedness already involves the idea of truth and the definition is closely circular in nature.

Definition 5
The fifth definition is:

A belief is true if and only if it leads to successful activity.

But there may be cases of true belief on the basis of which no activity is undertaken. A belief not actually leading to any activity cannot evidently be said to lead to any successful activity. Such a belief, if true, will provide a counter-example. It may be said that such a belief is capable of leading to such an activity; but we cannot here define capability without presupposing the concept of truth, for *ex hypothesi* if the belief were not true, it would not be regarded as capable of leading to successful activity.

Definition 6
The last of the definitions is:

A belief is true if and only if it is about something real.

Since a false belief also is about real things, the definition is clearly untenable. Unlike the *asatkhyātivādins*, the Naiyāyikas, particularly of the Navya period, who are supporters of the most uncompromising variety of *satkhyāti*,

hold that each and every content of false belief is real; hence the definition is too wide in respect of false beliefs.

It may be noticed that the third and fifth definitions represent coherence theory and the pragmatic theory as theories of truth, and Gaṅgeśa rightly rejects the definitions. I have argued against an analogue of the second definition in the Section II of the paper. The fourth definition introduces the negative concept of 'uncontradictedness', and it is intimately related with the concept of coherence. The first and the last definitions contain important insights. And if the first one is shorn of the doubtful claim of similarity between a belief and its content, the definition can be said to represent correspondence theory of truth. Gaṅgeśa's criticism will even then hold good, for the difficulty regarding the formulation of the bearer of truth (be that, proposition, statement or the like) and of the ontological counterpart (be that, fact, state of affair or the like), will render the concept of correspondence untenable, if we prefer not to go beyond a healthy ontology. The last definition can be rendered acceptable by depicting the structure of the belief and also that of the real thing the belief is about. Gaṅgeśa's own definition of truth as *tadvati tatprakārakānubhava*,[18] I believe, is a refinement of the insights contained in the first and the last definitions under consideration, and he has tried to avoid their defects. Our comments towards the end of the preceding section show how the insights contained in the other definitions can be utilized within the framework of Nyāya philosophy in formulating answers to the question how we come to know that a belief is true. I shall now proceed to explain Gaṅgeśa's own definition of truth with prefactory remarks about his theory of *prakāra*. What I state here is a very brief summary of some of the points I have argued for in my paper 'Studies in Gaṅgeśa's Theory of *Viśeṣaṇa*' (in *Jadavpur Studies in Philosophy*, Volume 4).

A *prakāra* is, in reality, a distinguishing feature. But in thought we may utilize it:

(1) In identifying the unique reference of an expression involving a general name with a definite article, for example, 'the' in English or with a definite position in a sequence, for example, *puruṣaḥ* in *puruṣaḥ daṇḍī* in Sanskrit;
(2) In making a judgement asserting possibility, for example, 'crows' in 'the house of Devadatta may have crows on it now', or 'pot' in 'there may be a pot in the room' as presupposed in the denial 'there is no pot in the room'; or
(3) In judgements where we make no assertions about definite objects, for example, in 'some' 'all' statements.

But when we use a feature in distinguishing from others a definite object identified with the help of some other feature in the manner indicated in the first case just noted, it performs a logically different role; and a distinguishing

feature in such a role is called a *viśeṣaṇa* by Gaṅgeśa while a feature in any of the other roles as in (1), (2) or (3) above is called an *upalakṣaṇa* by him. He thus maintains that a *prakāra* is either a *viśeṣaṇa* or an *upalakṣaṇa*, and on the basis of some of his points I attributed a theory of propositions of the following description to him in my paper referred to earlier.

(*a*) A singular proposition asserted in *viśiṣṭabuddhi* is one wherein at least one *prakāra* functions in the role of *upalakṣaṇa*, and at least one *prakāra* functions in the role of *viśeṣaṇa*, for example, *manhood*, as the former and *stick* as the latter in 'the man holds a stick (in his hand)' or *puruṣatva* and *daṇḍa* in *puruṣaḥ daṇḍī*.

(*b*) An existential general proposition is one which contains at least one *prakāra* and does not contain any *viśeṣaṇa*; and if it does not contain any *viśeṣaṇa*, and if it does contain more than one *non-viśeṣaṇa prakāra*, they are not related in the manner shown below.

(*c*) A universal general proposition is one which contains at least two *prakāras* and no *viśeṣaṇa*, i.e. *upalakṣaṇas* only when all the loci of one is regarded as the loci of the remaining one or ones.[19]

Given such a theory of propositions (I am not using the word 'proposition' in any Platonic sense here), Gaṅgeśa's definition of truth can be regarded as an acceptable theory capable of accounting for truth of any type of structured propositions. The following is a rendering of his definition:

> A belief ascribing a feature to a thing is true, if and only if the thing has actually that feature in it.

Supposing that the object lying in front of me is a piece of silver, my belief ascribing silverhood to the referent of the expression 'this' in 'this is silver' is true as the thing has actually silverhood in it.

Supposing that the object is only a shell and not a piece of silver, my belief of the foregoing specification will not be true inasmuch as the thing does not have silverhood in it.

Given that the definition is applicable to beliefs involving singular propositions, it can easily be extended to other cases if the scheme of propositions we have ascribed to Gaṅgeśa is acceptable. Since a relation is conceived as involving direction from *anuyogin* (the first term) to *pratiyogin* (the second term) the definition, if slightly modified, will be easily applicable to cases involving relations. Thus:

> A belief wherein a given thing is held to be related to another thing through a given relation is true, if and only if the things are related that way.

For example:

> My belief that Dasaratha is the father of Rama is true as Dasaratha is the father of Rama. [Commentators explain the term '*tadvat*' in Gaṅgeśa's definition in the sense of *tatsambandhi* to make the definition applicable to such a case.]

Gaṅgeśa's definition of truth as *tadvati tatprakārakatva* is not absolutely new in our philosophical literature. In this *Adhyāsaabhāṣya*, Śaṁkara defines a false belief as *atasmin tadbuddhiḥ*. Śaṁkara was a versatile scholar, and he must have in mind Vātsyāyana's characterization of *pramiti* as *tasminstaditi pratyayaḥ*[20] (*vide* his comments on *Nyāya sūtra* 2.1.36). But what deserves to be noted is that Gaṅgeśa was able to develop a sophisticated logical theory involving the concepts of *viśeṣya*, *prakāra* and *saṁsarga*. He was also successful in developing a theory of inference including an analysis of *vyāpti* and *pakṣadharmatā*. All these suggest that he was equipped with a theory of proposition and its division on the basis of its structural differences including quantifiers. His theory of different kinds of *abhāva* such as *ubhayābhāva*, *viśiṣṭābhāva*, and *anyatarābhāva* unmistakably suggests that he was also able to develop a logic of unstructured propositions. If we view his definition of truth against the background of all these theories, we can say that he was aware of the presuppositions and implications of his definition of truth; and this gives a new dimension to his definition. And we should not forget that he was able to disentangle the problem of definition of truth from what should be regarded as a theory of knowledge or justification, and I would say that Gaṅgeśa was consciously able to develop a theory of truth, which, if suitably interpreted, can be given a sophisticated look that we witness in some of the contemporary theories in the other tradition.

Notes and References

1. I have considered the claims of such a view in some detail in my paper 'Kindred Points in an Old Epistemology' published in *Our Heritage* of 1986.
2. A philosopher may take an extreme stand and thus may not distinguish between truth and generation by a source of knowledge. He may, therefore, offer a definition of truth with the help of an equivalence proposition to the effect that a belief is true if and only if it is due to a source of knowledge. But this, if offered as a philosophical definition, is not surely acceptable. I cannot state for certain that no philosopher did ever try to offer a definition of truth in such a manner. It can, however, be said with authenticity that many of the Naiyāyikas did offer a separate definition of truth without reference to the causal conditions of a true belief. In fact, Gaṅgeśa himself has offered his own definition of truth after rejecting a type of the definition under reference. (See the last section of this paper.)
3. See *Pariśuddhi*, p. 660 and also pages 253-57 of my book *Perspectives on Nyāya Logic and Epistemology*.

4. TCM, *Pratyakṣakhaṇḍa* Asiatic Society, p. 352; *Anumānakhaṇḍa*, Chowkhamba, p. 1934, *Śabdakhaṇḍa*, Asiatic Society, p. 46.
5. Thus, though evidence and truth are independent of one another, this empirical basis supports the expectation that evidence is perhaps a sign for truth.
6. *..siddhāntāviruddha..* See *Nyāyasūtra* 1.2.1.
7. *Tantrādhikaraṇābhyupagamasaṁsthiti siddhāntaḥ*. See *Nyāyasūtra* 1.1.26.
8. *Siddhāntamabhyupetya aniyamāt kathāprasaṅgo' pasiddhāntaḥ*. See *Nyāyasūtra* 5.2.23.
9. *Kālātyāpadiṣṭaḥ kālātītaḥ*. See *Nyāyasūtra* 1.2.9.
10. *..tatha cakṣurādibhiḥ sukhādaya na gṛhyante iti karaṇāntareṇabhavitavyam tacca jñāṅāyaugapadyaliṅgam...*See *Bhāṣya* on *Nyāyasūtra* 3.1.18.
11. *Ātmādiṣu sukhādiṣu ca pratyakṣalakṣaṇa vaktavyam?—See Bhāṣya on Nyāyasūtra* 1.1.4.
12. For various examples and explication of the concept, see *Bhāṣya* on *Nyāyasūtra* 1.1.10.
13. See *Bhāṣya* on *Nyāyasūtra* 3.1.1.
14. *...evam mantuḥ sarvaviṣayasya matisādhanam antaḥkaraṇabhūtaṁ saravaviṣayaṁ vidyate yenāyaṁ manyate*. See *Bhāṣya* on *Nyāyasūtra* 3.1.17.
15. I have borrowed the expression from Donald Davidson's paper 'Coherence Theory of Truth and Knowledge' (p. 308) in *Language and Reality* to mean the various *pramāṇas* admitted in Nyāya, though I am not sure whether this will be permitted by Davidson.
16. Though like the foundationalists the Naiyāyikas admit certain experiences as self-certifying, unlike them the Naiyāyikas do not assign these experiences any foundational status. In fact, according to the Naiyāyikas, when an experience is a justifier in respect of any belief which should necessarily be other than itself, the justifier never guarantees the truth of the justified belief and I take this to be the moral of their theory of *parataḥprāmāṇya*. Strictly speaking, the concept of self-justification, if used as a tool for guarantee of truth, does voilence to the hypothesis of the justification condition as a condition for knowledge independent of its truth-condition. In a sense then, the self-certifying nature of the internal experiences of the sort noted earlier is not such that they will be deemed true, even if all our objectual experiences were one and all false and vulnerable. They all hang together, and there cannot be any question of veracity of one type in the face of falsity of the other type. But as the objects of such experiences are not public objects, there cannot be any relevance of the sort of test we employ in respect of publicly observable objects, and the claim that internal experiences are self-certifying only accommodates this negative point and is not to be understood differently.
17. An account of the definitions Gaṅgeśa rejects has been given by J.N. Mohanty in his book *Gaṅgeśa's Theory of Truth* (pp. 40-42).
18. TCM, *Pratyakṣakhaṇḍa*, Tirupati, p. 436.
19. The idea of a universal proposition is taken to have been suggested by the phrase *pakṣatā-avacchedaka-avacchedena* and that of an existential proposition by *pakṣatā-avacchedaka-sāmānādhikaraṇyena*. We can make it general, i.e. applicable to non-inferential beliefs by simply substituting in permissible places *viśeṣyatā* for *pakṣatā*.
20. For details see his comments on *Nyāyasūtra* 2.1.36. I am indebted to Srinivasa Rao for this reference.

Bertrand Russell and liberty: a question revisited

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I seek in this essay to discuss a question afresh.* How, if at all, does Russell's philosophical thought determine his view of liberty?

It is not without reason that I demur as I ask. At least once Russell himself declared that there was no necessary connection between his logico-epistemological theories and his socio-political views:

> I note with pleasure that he [E.C. Lindeman] sees no necessary connection between my views on social questions and my views on logic and epistemology. I have always maintained that (though there is, I think, a psychological link) there was no logical connection, pointing to the example of Hume, with whom I agree so largely in abstract matters and disagree so totally in politics. But other people, for the most part have assured me that there was a connection, though I was not aware of it.[1]

The passage not only denies a relation but is positive in value. A distinction is suggested between the logically necessary and the psychologically so. Here, it is obvious, Russell follows Hume. And today, as we know, it is commonly accepted that, where as psychological necessity is merely the compulsion of an expectation generated by the repeated experience of a particular sequence of *facts* in the past, logical necessity is a *meaning*-relation which thought cannot deny without contradiction. Therefore, in Russell's view, where a man holding a particular philosophical position is tempted to do his political thinking in an accordant way, the necessity is only psychological, not logical. If we here ask him to support his view with some evidence from the region of fact, Russell would promptly invite attention to the following: 'Empiricism, broadly speaking, is connected with liberalism, but Hume was a Tory; what philosophers call 'idealism' has, in general, a similar connection with conservatism, but T.H. Green was a Liberal.'[2]

Russell's net meaning here is that—as in the case of philosophers just referred to, so in his own—philosophical views are no necessary shapers of political ideology. But, one may ask, if definite political and philosophical views can *co-exist* in the same individual *without* influencing each other, is not a distinct emphasis of Russell's philosophy, the theory of external relations, at once illustrated? How, then, is his philosophy outgone?

Russell's answer here would, however, be ready. The theory of external relations certainly covers, but it does nothing to *refute* his statement that his

*For the greater part of this essay, I am indebted to Dr. S.K. Saxena, formerly Professor of Philosophy, University of Delhi, Delhi.

political convictions are independent of his philosophy. To protest that the theory in question is here clearly availed of is really to mean that Russell's political and philosophical views do not interact; and this only confirms what he says. So, the doubt we have raised is no real objection to his view as to the independence of his politics from his philosophy.

Yet, in many a matter of detail I find it possible to show that Russell's philosophy influences his views on political matters.

(*a*) To begin with, it is his acceptance of empiricism in philosophy that probably induces him to be a liberal in politics. Empiricism is based on regard for verifiable fact. It entails, therefore, readiness to change one's views in response to varying evidence. No claim to finality is here made. Empiricism discourages dogmatism and the common tendency to somehow make others yield to one's views. It inclines a man, as a rule, to liberalism in politics.

Russell himself invites notice to the link that I argue for:

> The Liberal creed, in practice, is one of live-and-let-live, of toleration and freedom so far as public order permits, of moderation and absence of fanaticism in political programmes... The essence of the liberal outlook lies not in what opinions are held, but in *how* they are held: instead of being held dogmatically, they are held tentatively, and with a consciousness that new evidence may at any moment lead to their abandonment.[3]

Yet, though I here take its help, the passage seems suspect in one respect. It opens in a way that appears too sweeping. The essence of the liberal creed, it is held, lies wholly [not merely largely] in *how* our views are held, and not [at all] in *what* views are held. The way our views are held is here sharply disjoined from their content or substance, and value is seen to reside only in the former. This is, to be sure, questionable. For, as the passage itself suggests towards the close of its very first sentence, in addition to respect for social stability, it is essential *that* we regard individual liberty as important and authoritarianism as rejectable.[4] Russell himself insists that no constraint or vagary of outer circumstance should be allowed to bedim our passion for individual freedom:

> In this lies Man's true freedom: in determination to worship only the God created by our own love of the good, to respect only the heaven which inspires the insight of our best moments. In action, in desire, we must submit perpetually to the tyranny of outside forces, but in thought, in aspiration, we are free, free from our fellow-men, free from the petty planet on which our bodies impotently crawl, free even, while we live, from the tyranny of death.[5]

Incidentally, if in a fairly philosophical work Russell speaks of freedom [as here] in such a comprehensive way, covering not only defiance of outer

oppression but self-expansion in thought and creative insight, it would be odd to complain that, whereas he champions individual liberty in politics, as a philosopher Russell rejects the thesis that man's will is free.

(*b*) This point, however, calls for a closer look. What does Russell *the philosopher* think of our freedom of will? I find that his penchant for both analysis and empiricism prevents him from taking a categorical position with regard to this important question. He would like us to believe, I may add, that the will is determined in some ways *and* free in others; and this, he would point out, is the evidence of fact itself. We, indeed, commonly admit that a good education and diet can exercise a healthy influence on the character of the young; and that, on the other hand, a grown-up individual [quite unlike an old car] must be held to be responsible for his misconduct. In so far as imputability implies freedom of will, the belief we have just outlined accepts that man is not only determined but also free.[6]

Here, however, a protest is possible. In *My Philosophical Development* where he lists his sceptical attitudes, Russell opens thus: "...I came to disbelieve first in the free will..."[7] But, if he disclaims belief in free will, how are we justified in having maintained that, according to Russell, the will is both determined *and free*? The answer, in my view, could be that the freedom that Russell here rejects is of the absolute kind—that is, freedom as utter absence of all determination. But this has to be brought out with care. See, first, the following from Russell:

> Emphatic cases of volition, where we decide after a period of deliberation, are merely examples of conflicting forces. You may have both pleasant and unpleasant associations with some place that you are thinking of going to; this may cause you to hesitate, until one or other association proves the stronger.[8]

Here, indeed, the clear suggestion is that man does not choose freely, and that the choice is determined *for him* by some factors outside the agent's own will. But I do not think we can stop here. For, if we do, it would be difficult to make sense of Russell's following utterance of faith: 'In action, in desire, we must submit perpetually to the tyranny of outside forces; but in thought, in aspirations, we are free...'[9]

Are thought and aspiration, I ask, merely shut out, so to say, by a case of intense willing? We can hardly say, yes; and so, with equal regard to the two extracts cited, I would like to put Russell's overall meaning in the following way:

Man's will is not as free as it might appear to be. It is not guided by thought alone. The pull of some associations may also determine it. But, and this *I* add as a supplement demanded by the need to balance the two citations,[10] the pull or pleasantness of an 'association' is nothing merely objective. A thing becomes or appears pleasant [also] because of the man's own likes and

dislikes, so that in letting his choice tilt towards an 'association' he is not being determined by a *merely* objective factor.

To conclude, the 'freedom' that Russell denies in philosophy is freedom [mis]understood as absolute. But then, is not the freedom he advocates in politics also *subject to* the overriding constraint of social stability? Instead of denying freedom in philosophy and pleading for it in politics, Russell, I, therefore, conclude, speaks for roughly the same kind of freedom in the two spheres. He warns us repeatedly that the state's insistence on acquisition of 'the greatest possible amount of external force' may curtail our individual liberty[11] as directly as it may prevent 'men from growing to their full mental stature' by generating fear of war;[12] and he says categorically that 'the only function of the state in regard to...[the creative] part of the individual life should be to do everything possible toward providing outlets.'[13]

(*c*) But, we may ask, are Russell's views on liberty directly related to any specific philosophical emphasis of his? Ronald Jager, besides many others,[14] would like to answer this question affirmatively. He indeed remarks:

> It is no accident that an atomist in metaphysics turns out to be an individualist in ethics and politics. For both the fundamental theoretical problem is the nature of these relations, external or internal, that bind the atoms together, or isolate them.[15]

But I find the assumptions questionable, and would like to argue as follows: 'Logical atomism is the view that the world consists of simple facts, each of them independent of all the rest.'[16] Of the human individual, on the other hand, Russell speaks thus: 'Man... is a semi-greagarious animal. Some of his impulses and desires are social, some are solitary.'[17]

Now, if some of a man's impulses are necessarily social, how can he be said to be independent of all relations? And does not Russell repeatedly say that the proper growth of an individual *depends on* a general atmosphere of freedom from state interference?[18]

Indeed, in his view, though the state may well be said to exist *for* the individual, the latter should never be swamped by the state. Here Russell is, as we know, categorical. Nor does he accept Hegel's view that an individual outside the state is as insignificant as the human eye apart from the living body. The crux of Russell's protest here simply is that what is true of one whole may not be true of all wholes.[19] And, indeed, whereas the eye becomes wholly useless when taken out of the living body of which it is a vital part, the individual who takes a decided stand *against* the state on legitimate grounds deserves recognition, because he does a definite 'service to society.'[20]

(*d*) Students of Russell's thought, however, have also at times emphasized the *divergence* of his political views from his philosophy. Reason, we are told, plays a major role only in his philosophy, not in his political theory. It is

further contended that his politics is grounded wholly in the psychological concept of impulse.[21]

Now, there is no doubt as to the value Russell attaches to impulse. He opposes conventional morality on the ground that it does everything to suppress the higher impulses and to encourage the lower.[22] Indeed, his view of the good life turns on the concept in question:

> There are two kinds of impulses corresponding to the two kinds of goods. There are *possessive* impulses, which aim at acquiring or retaining private goods that cannot be shared; these centre in the impulse of property. And there are *creative* or constructive impulses, which aim at bringing into the world or making available for use the kind of goods in which there is no privacy and no possession. The best life is the one in which the creative impulses play the largest part and the possessive impulses the smallest.[23]

Now, it is difficult to acquiesce in Russell's wholesale rejection of conventional morality including the well-known Christian maxim: 'Love thy neighbour as thyself.' But his view of the good life deserves close attention.

Let us first see what Russell means by possessive and creative impulses. As a relation of man to material goods, possession is unique. It so relates a man to things that others are at once denied access to them. In other words, all possessions tend to be exclusive. A creative or constructive impulse, on the other hand, at once makes for a kind of self-transcendence. It is a natural tendency to produce things or establish institutions which expect and provide for the attention and participation of fellowbeings in such a way that a man feels fulfilled or satisfied; and does not, in the process, inflict any avoidable harm on them. Every exercise of a creative impulse caters for both the individual and society. It makes a man experience the delight of self-giving. What the creator brings into being is, in principle. accessible to all; but it also makes him realize his freedom to create, and to add to the richness of life in his own chosen way.

All this is fairly easy to see. But Russell's talk of 'goods in which there is no privacy *and* no possession' is to be carefully understood. The 'and' is here significant, for the entire complex of words cited is to be taken as one. But let me explain.

If we take a work of art, an admitted product of the creative impulse, we find that it *is* 'private' in a special sense. Experts in art appreciation agree that every great work of art has its own 'interiority' or private world; and that, in order to get at its real import, one has to *dwell within* the work's individual bounds, instead of just looking at it, say, as a mere onlooker. The very impulse to create art, as Russell rightly says, is 'of infinite value *to the individual*'[24]. So, what he means in the present context only is that the work which an artist brings into being, though it is his creation, and is, therefore, dear to him, is from the beginning *meant for objective contemplation*; and that,

though the work's own world is private and has to be entered into with care and may be even reverence, the work itself is not his personal possession in the same sense in which his material belongings are. Privacy is there *in* the work of art. But the work's message is not *for* the artist alone. Quite, unlike his personal property, it is meant for all those who are eager and eligible to turn to it. Hence says Russell: 'No privacy *and* no possession.'

But, and this is the point I would like to press, if what Russell recommends is a society wherein the creative impulses may enjoy freer play, his leading idea is not that of mere impulse, but of their regulated working; and, in so far as what balances conflicting forces is reason, reason must be given due importance in Russell's view of the good life. See here his own following words:

> It is common to speak of an opposition between instinct and reason... But in fact the opposition of instinct and reason is mainly illusory. Instinct, intuition, or insight is what first leads to the beliefs which subsequent reason confirms or confutes... Reason is a harmonizing, controlling force rather than a creative one.[25]

(*e*) There is one other 'divergence' which some thinkers see in Russell, and which *I* find it difficult to accept. John Lewis invites attention to what he speaks of as a clear: '... dichotomy between [Russell's] logico-mathematical metaphysics on the one hand and the categorical imperative of his moral convictions on the other.'[26]

To me, however, the passage cited seem to miss the truth. As a philosopher Russell has written freely on ethical values; and, when he expresses his desire to keep ethics away from philosophy, his meaning only is that, as the pursuit of truth, philosophy should not be *guided* by the pre-fixed desire to, say, elevate society. The function of philosophy, according to him, is simply to record things as they are. See, here, Russell's own following words: 'I believe, however, that the elimination of ethical considerations from philosophy is both scientifically necessary and—though this may seem a paradox—an ethical advance.'[27]

There *is* a kind of philosophy which is inspired by the desire to raise the moral tone of society. Nor can we deny the value of such a philosophy. Yet, in Russell's view, philosophies of this kind cannot be said to be really scientific. Scientific philosophy aims at understanding the world *as it is*. It does not prescribe what directions the world *should* take. In ethical matters the premises arise from feeling; in matters of fact they issue from perception. So, a scientific philosophy which aims at investigating truth would do well to eschew subservience to ethical motives, and to go instead only by the evidence of fact. But, Russell adds, once the truth has been seized it becomes our moral duty to hold onto it and to cherish it. Ethics should now be allowed free play. Russell's net view is here quite balanced: 'Ethical considerations... should appear as determining our feeling towards the truth and our manner of ordering our lives in view of the truth.. [though] not as themselves dictating what the truth is to be.'[28]

Notes

1. Bertrand Russell, 'Reply to Criticism' in Paul Arthur Schilpp (ed), *The Philosophy of Bertrand Russell*, Illinois: The Library of Living Philosophers, 1946, p. 727.
2. ———, 'Philosophy and Politics' in his *Unpopular Essays*, London: Allen & Unwin, 1968, p. 9.
3. *Ibid.*, p. 21.
4. See here the words: 'Live-and-let-live'.
5. Bertrand Russell, 'A Free Man's Worship' in his *Mysticism and Logic*, London: Allen & Unwin, 1963, p. 43.
6. I have built upon pp. 37-38 of Bertrand Russell's *Why I Am Not a Christian*, London: Allen & Unwin, 1975.
7. Bertrand Russell, *My Philosophical Development*, London: Allen & Unwin, 1975, p. 9.
8. ———, *An Outline of Philosophy*, London: Allen & Unwin, 1970, p. 232.
9. 'A Free Man's Worship' in Bertrand Russell's *Mysticism and Logic*, London: Allen & Unwin, 1963, p. 43.
10. On the other hand, I see it clearly that the words: 'merely examples of conflicting forces' in the quotation from *An Outline of Philosophy* suggest a clear denial of free will.
11. Bertrand Russell, *Principles of Social Reconstruction*, London: Allen & Unwin, 1971, p. 45.
12. *Ibid.*, p. 47.
13. Bertrand Russell, *Political Ideals*, London: Allen & Unwin, 1963, p. 74.
14. Including, say, John Lewis. See his *Bertrand Russell: Philosopher and Humanist*, London: Lawrence & Wishart, 1968, p. 82.
15. Ronald Jager, *The Development of Bertrand Russell's Philosophy*, London: Allen & Unwin, 1972, p. 428.
16. B. Blanshard, *Reason and Analysis*, Illinois: Open Court Publishing Co., 1964, p. 127.
17. Bertrand Russell, *Human Society in Ethics and Politics*, London: Allen & Unwin, 1971, p. 16.
18. He does quite freely. See, for instance, his *Political Ideals* London: Allen & Unwin, 1963 (pp. 75-76) and *Roads to Freedom*, London: Allen & Unwin, 1966 (pp. 83, 95-96).
19. Bertrand Russell, *History of Western Philosophy*, London: Allen & Unwin, 1974, p. 713.
20. ———, *Political Ideals*, London: Allen & Unwin, 1963, pp. 75-76.
21. John Lewis says that for Russell, 'the true home of reason is another world, a world of abstract logical entities and relations, with a perfection of its own which the intellect can enjoy untroubled by passion and desire.'
    John, Lewis, 'Bertrand Russell and the Illusion of Freedom' *Modern Quarterly*, Vol. 4, No. 4, 1949, p. 341.
22. Bertrand Russell, *Why I Am Not a Christian*, London: Allen & Unwin, 1977, p. 26.
23. ———, *Political Ideals*, London: Allen & Unwin, 1963, pp. 11-12.
24. *Ibid.*, p. 69. Italics added.
25. Bertrand Russell *Our Knowledge of the External World*, London: Allen & Unwin, 1982, p. 31.
26. John Lewis, *Bertrand Russell: Philosopher and Humanist*, London: Lawrence & *Wishart*, 1968, p. 93.
27. Bertrand Russell, 'Mysticism and Logic' in his *Mysticism and Logic*, London: Allen & Unwin, 1963, p. 28.
28. *Ibid.*, p. 13.

Truths without facts*

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Truth was one of the main topics of traditional philosophy, of philosophy as we knew it to be in the past, and it continues to be one of the major concerns of the philosophy of our time. (Donald Davidson's collection of essays, published in 1984, is called *Inquiries into Truth and Interpretation*;[1] and Michael Dummett's collection of essays, published only a few years ago in 1978, is called *Truth and Other Enigmas*).[2] But when a student of traditional philosophy looks at what now goes on under the name of 'theories of truth', he cannot but feel estranged, and is frequently forced to wonder whether the traditional understanding of 'the problem of truth', and the different theories put forward for their solution—correspondence, coherence and pragmatist theories, for example—are all wrong. So the question concerning the relation, or the lack of relation, between the traditional ways of thinking about truth and the recent literature on the subject is eminently worth discussing. Davidson discusses the question in his excellent 'True to the Facts' (originally, in the *Journal of Philosophy*, Vol. 66, 1969),[3] but there is room, as well as need, for continuing the discussion. What I want to discuss, in particular, is how well or ill the traditional view that truth consists in correspondence with facts, fares in the light of the recent developments in semantics and philosophy of language.

I

The term 'theory of truth' can be, or has actually been, used to stand for different exercises. The following are the most important ones:

A. A philosophically satisfactory account of the *concept* of truth. Here we try to answer such questions as: 'What do we mean when we say that a

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sentence, or a proposition, or a statement, or whatever, is true?' The exercise belongs to what is known as philosophical analysis, and is traditionally associated with the attempt to arrive at adequate definitions or explications of concepts. The conventional theories of truth—the correspondence, coherence and pragmatist theories—are theories of this kind.

B. A theory which would enable us to determine the truth of all sentences (or whatever it is that can be said to be true or false) that are true. One may want to have a theory of this kind out of a feeling of dissatisfaction with theories of the first. One may think that a theory of the first kind has very little substance, as it does not tell us anything about which sentences are true and which sentences are false, telling us only what constitutes the truth of a sentence which happens to be true. A little reflection would, however, show that, even if such a theory is at all possible, it would not be, for it cannot be, a *philosophical* theory; for whether or not a sentence is true is, for an overwhelmingly large class of sentences, an *empirical* question, and an empirical question of a sort to which no *philosophical* question can belong. Consider all the questions of physics and chemistry, of biology and economics, and of sociology and history, as well as of the questions of logic, mathematics and of philosophy itself; if a theory of truth of the kind we are now considering was possible at all, this single theory would provide an answer to each of these questions. It is quite clear that there is no such theory, and had there been any such theory it would not have been philosophical.

I do not suggest that any philosopher has ever actually tried to have such a theory, or has even maintained that it was possible. I mention this only as an example of what a philosophical theory of truth is not; *and* to point out what may be obvious anyway, viz. that the theories of the kind I am going to mention next are very different, although they have a kind of substantiality, a craving for which may lead one to contemplate the possibility of the second kind of theory we have just discarded.

C. A theory for a systematic determination of the *truth-conditions* of all statements. It does not set out to determine whether a statement (in a given language) is true, but only the conditions under which it would be true. This is the kind of theory logicians offer for statements of their formalized languages under the name 'semantics', and the kind of theory Tarski has taught us how to construct (in his epoch-making essay 'The Concept of Truth in Formalized Languages')[4].

D. A (second order) theory about the conditions which a (first order) theory of the kind *C* must satisfy, if it is to count as an adequate theory of truth. We can say that, while one part of Tarski's essay offers a theory of the kind *C*, another part offers a theory of this kind. It is that part of the essay which lays down conditions for the *material adequacy* of *any* theory of truth.

II

I have said right in the very beginning that a student of traditional philosophy feels estranged when he looks at what goes on under the title 'theories of truth'. It is mainly the development of theories of the kinds *C* and *D* which causes this feeling of estrangement. The different kinds of theories we have distinguished, the kinds *A*, *C* and *D*, if we set aside the discarded kind *B*, are not, however, unrelated; and, when we see their exact relationship, we realize that in and through all the diversities and innovations there is a continuity which holds the past and the present together. The connection between a theory of the kind *C* and a theory of the kind *D* is quite obvious: the shape of any theory of the first kind is determined by some theory of the second, for the latter lays down the very conditions for the adequacy of the former. It is not difficult to show the connection between theories of kinds *A* and *D* either. Look at Tarski's 'The Concept of Truth in Formalized Languages' which is devoted to arriving at a satisfactory definition of truth. The definition Tarski reaches at the end of a long and painstaking exercise is meant primarily for sentences—sentences alone are treated by him as either true or false—which belong to the calculus of classes; but he also tells us how similar definitions could be constructed for sentences belonging to any language which meet some basic requirements. If we allow ourselves to generalize on Tarski's definition, we can say that he has defined truth as follows:

> *x* is a true sentence *if and only* *x* is a sentence and every (infinite) sequence of objects satisfies *x* (see Definition 23).[5]

Now, if we ask Tarski why we should accept this definition, his answer would be that it is formally correct (not leading to any contradiction or antinomy), *and*, what is more important, is *materially adequate*. But what is this material adequacy? A definition of truth, says Tarski, is materially adequate, if, and only if, it satisfies the condition laid down in what he calls the 'Convention T', which is roughly, that, for any sentence of the object-language in questions, the definition must entail, i.e. have as consequence, a metalanguage sentence of the following scheme[6] (conveniently called 'Schema T' by many):

x is a true sentence *if and only if p*

where '*x*' is replaced by a (structural-descriptive) name of the (object-language) sentence and '*p*' by a translation of this sentence in metalanguage, or by the sentence itself, in case the metalanguage contains the object-language as a proper part.[7] If we now ask why we should at all accept the so-called 'Convention T' itself, the only answer which seems possible is that the convention captures our intuitive idea of *what truth is*, our very conception of truth. The intuitive force of the convention comes out clearly in the particular instances of the above schema. Ignoring, as Tarski himself occasionally does, the niceties of structural-descriptive names and of the object-metalanguage distinction, we

can take the following to be a typical instance of the 'Schema T':

'Snow is white' is true *if and only if* snow is white.

The above seems to be a cons equence of a certain conception of truth, of what, according to many, is the very conception of truth that we have, of what we mean when we say that something is true. When we say 'Snow is white', we say about snow that it is white, and, therefore, what we say is true if, and only if, snow is white.

So the structure of Tarski's thought in his essay is this: he has a certain conception of truth—an intuitive idea of what truth is; this leads him to lay down a certain condition for the material adequacy of *any* definition of truth; and, then, in accordance with this condition of adequacy—the 'Convention T'—he constructs a definition of truth. The definition, constructed in terms of the idea of satisfaction, is such that it provides Tarski with what may be called a *derivational system* which enables him to derive, for any sentence, an instance of the schema (an instance which can be briefly called 'a T-sentence'). It is this possibility of deriving a T-sentence for any given sentence that shows that the formal definition accords with our basic intuitions about truth. If this be the structure of Tarski's thought in his essay, then, within the scope of this one single essay, he has contributed to all the different kinds of truth theories we have distinguished at the very outset: a philosophically satisfactory account of the very conception of truth (theory of the kind *A*); a systematic determination of the truth-conditions of all sentences, taking the form of the derivation of a T-sentence for each of them (theory of the kind *C*); and a second-order theory about the condition of adequacy for a theory of the kind *C* in the 'Convention T' (theory of the kind *D*). Not only that, Tarski has also shown how intimately these theories are connected with one another, and, furthermore, how a theory of the third kind determines theories of the other kinds. In fact, Tarski himself conceived of his own task to be an integrated one, and it is that of capturing in an articulate form our very conception of truth. So he says: I shall be concerned *exclusively* with grasping the intuitions of the *classical conception of truth*...[8] And he begins with the following as his first formulation of what he calls a *semantical definition:* 'A true sentence is one which says that the state of affairs is so and so, and the state of affairs *indeed* is so and so.'[9] This formulation, grants Tarski, 'leaves much to be desired'. 'Nevertheless', he adds, 'its intuitive meaning and general intention seem to be quite clear and intelligible. To make this intution more definite, and to give it a correct form is precisely the task of a semantical definition.'[10]

So it seems that the philosophers are still doing the same old thing when they are constructing a theory of truth. Of course, they are doing it in their own way, and may be that is a better way of doing it. But there is no real reason for the feeling of estrangement we have been speaking of.

III

From what we have just said it would appear that I want to maintain that the primary task of a philosopher reflecting on truth is that of arriving at a satisfactory definition of the concept. 'Definition' may sound to be too strong a term; well, if it does, we need not use it. What I want to maintain is that a clear articulation of the conception of truth that we have, or, if you want, of what we mean when we say that a sentence (or a statement or a proposition) is true, is the primary task of a philosopher; for it is this conception of truth, and what we think is the best way of articulating it, that determines both the form and content of whatever other theories we may have. But there is a very strong objection to this line of thinking, an objection which comes from Frege. He has argued (in his 'The Thought: A Logical Inquiry'[11]) that truth cannot be defined. So, if we want to pursue this line of thinking, in whatever manner we want, whether it is Tarski's or of some other's, we have to meet Frege's argument. And that is what I should like to do now.

Frege's argument is initially directed against the correspondence theory. He concedes that the truth of a *picture*, as distinguished from a proposition (or, as he calls it, a 'thought'), *can* be defined in terms of correspondence. We can say, for example, that the truth of a picture of the Cologne Cathedral consists in its correspondence with the Cologne Cathedral. But this only means, says Frege, that the truth of the picture consists in the truth of *the thought that the picture corresponds with the Cathedral.* And that is precisely the reason why the truth of the *thought* cannot be defined in terms of correspondence with some *X* (a state of affairs, a fact or whatever). For, by parity of reasoning, we shall, in giving such a definition, be saying that the truth of the thought that the picture of the Cologne Cathedral corresponds with the Cologne Cathedral —call this thought *T*—consists in the truth of another thought, viz. the thought that this thought *T* corresponds with *X*. And we are now on the way to an infinite regress. Frege is not, however, content with arguing against the correspondence theory alone. He argues against any definition of truth, and the pattern of argument is the same. In fact, his argument against the correspondence theory itself is, potentially, a quite general argument which can be directed against any proposal to define truth in terms of some property of thought, or whatever it is that is true; the defining property need not be the relational property of correspondence. Let *F* be any property in terms of which the truth of a proposition *P* is defined. Then the truth of *P*, Frege would say, consists in the truth of a *second* proposition, viz. *that the proposition P has the property F*. And it is this which starts the infinite regress. We can note that this argument, if valid, would destroy Tarski's definition of truth as well. Here, the relevant property would be *the property of being a sentence satisfied by all* (infinite) *sequences of objects*. Frege would say that, if the truth of a sentence consists in having this property, it really consists in the truth of another sentence:

'the first sentence has the property in question'. And here is the beginning of the infinite regress.

This ingenious argument of Frege's had remained mostly overlooked until it was raked up by Michael Dummett in his *Frege: Philosophy of Language* (chapter on 'Can Truth be Defined?').[12] Dummett considers the argument at length, and comes up with the conclusion that, while Frege's regress argument is valid against some proposed definitions of truth, it is not valid against all, and the net effect of the argument is that it places some constraints on theories of truth by bringing to light at least one condition which any theory of truth must satisfy. What Dummett wants to say can be brought out as follows.

Let F be the property in terms of which truth is defined. Now, the definition of truth in terms of F would lead to a vicious infinite regress if, and only if, the definition entails this consequence; to determine (*a*) whether a sentence (or proposition or whatever), e.g. the sentence 'Frege died in 1925', had the property F, we had to determine (*b*) whether *another* sentence, viz. 'The sentence 'Frege died in 1925' has the property F', had the property F; and to determine this *latter*, we had to determine (*c*) whether a *third* sentence, viz. ''The sentence 'Frege died in 1925' has the property F' has the property F', itself had the property F; and so on. But if, on the contrary, to determine (*c*) is the same as determining (*b*), and to determine (*b*) is the same as determining (*a*), there is no infinite regress. But here comes the next and the most important point. If the infinite regress is to be stopped in this way by allowing a reduction of (*c*) to (*b*) and of (*b*) to (*a*), a further reduction—this time a reduction of (*a*) itself—must be allowed. That is, we shall have to allow such a reduction as that *to determine whether the sentence* (thought, proposition) '*Frege died in* 1925' *has the property F is to determine whether Frege died in* 1925. In fact, if we do not allow this last reduction, we shall not be able to stop the infinite regress from generating. For, if the question whether the sentence 'Frege died in 1925' has the property F is a distinct question from the question whether 'Frege died in 1925', and if we have to find an answer to the first question in order to arrive at an answer to the second, then, by parity of reasoning, the question whether 'The sentence 'Frege died in 1925' has the property F' has the property F is distinct from the question whether the sentence 'Frege died in 1925' has the property F, and we have to find an answer to the former in order to arrive at an answer to the latter.

So it follows, Dummett argues, that, if a definition of truth in terms of a property is to avoid Frege's charge of infinite regress, then the property must be such that it would allow the kind of reduction needed. Tarski's definition of truth can avoid Frege's charge for this reason. His equivalence thesis, given in the form of the 'Schema T', effects exactly this reduction. If it is said at this point that the 'Schema T' is not quite relevant to the present argument since it does not mention any property other than truth in terms of which it is defined, we can surely point out in Dummett's support that the property in terms of which truth *is* defined by Tarski has also the same desirable feature. A recursive definition is so constructed for *satisfaction by infinite sequences of objects* that the question whether, say, 'Frege died in 1925' is satisfied by all infinite sequences of objects reduces itself to the question whether Frege died in 1925; the reason being that, according to the definition, the satisfaction holds if and only if Frege died in 1925.[13]

IV

Let us come back to our original theme: the continuity that holds together the past and the present theories of truth, and the ideas that a clear perception of this continuity can remove the feeling of estrangement which a student of the past theories has when he looks at the present. We have seen that the principal occupation of a philosopher continues to be an articulation of the very concept of truth; and that he can attain this articulation in the form of a definition too, provided he is careful enough in the choice of his definiens. So it seems that we, the students of the past, can feel happy again. But those of us who, like me, feel attached to the classical conception of truth, to use Tarski's phrase, can still have our misgivings. For an essential component of this classical conception is the idea of correspondence, and we cannot be indifferent to the question of whether the definition that is constructed according to Frege's requirement leaves any room for this idea. If Dummett is right, it cannot, for, he argues, the *correspondence* theory cannot avoid the charge of infinite regress.

Let us consider this point then. Why should the correspondence theory necessarily fail to meet Frege's requirement ? This requirement, as Dummett puts it, is that the definition must yield the desired equivalence we spoke about. So, presumably, what Dummett holds against the correspondence theory is that it does not yield this equivalence. But it is not clear to me why it should not. Let us suppose that truth *is* defined in terms of correspondence, and correspondence with facts. Then we first have the equivalence:

'Frege died in 1925' is true *iff* it corresponds with facts (or some fact).

But we can have, as preparatory to our definition of truth, clauses defining *correspondence*, just as Tarski had a recursive definition of satisfaction which enabled him to define truth in its terms. The following would be one such clause:

'Frege died in 1925' corresponds with facts *iff* Frege died in 1925.

And such clauses as this would fulfil the requirements of the equivalence thesis, the fulfilment of which saves a definition from infinite regress. Furthermore, such saving clauses need not be viewed as *ad hoc* devices for blocking the regress. They have good intuitive justification in their favour. Note that the sentence

> 'Frege died in 1925' corresponds with the facts' is equivalent with the sentence
>
> It is a fact that Frege died in 1925,

and the latter, obviously, is equivalent with

> Frege died in 1925.

Given these equivalences, we can even have, if we want, the Tarski equivalence as well:

> 'Frege died in 1925' is true *iff* Frege died in 1925.

But we have now arrived at this equivalene through a step which makes use of the notion of correspondence.

So we can perhaps say at last that we can have everything that we wanted to have: we can have a definition of truth, this definition can be given in terms of correspondence, and this correspondence can be said to be correspondence with facts. And with this, we can add, we have completed our task of showing the continuity between the past and the present in the theories of truth.

But doubts still linger. Is the concept of fact we have just used to arrive at the equivalences, required for stopping Frege's regress, the same as the one associated with the traditional correspondence theories? Perhaps not. But to the extent it is not, we should dispense with the traditional concept. On the conception of facts we have just used, to inquire whether 'Frege died in 1925' corresponds with a fact is to inquire whether Frege died in 1925, i.e. it is to inquire about Frege. It is not to inquire about whether or not a certain relation obtains between a sentence (or a proposition) and a fact. Even if it is to inquire about the relation, the only way to find out whether or not this relation obtains is to find out whether or not Frege died in 1925. What we have to make our object of inquiry is Frege, his life, or, if you like, his death. While finding out our answer to the question 'Did Frege die in 1925?', we need not get hold of the sentence (or the proposition) in one hand and the relevant fact in another, and then compare the two to find out whether or not one corresponds with the other. Any idea of correspondence with facts which encourages this kind of thought must be avoided. It is precisely such an idea which has attracted most of the objections we encounter in the literature on the subject. And justifiably so. To see quickly that this conception of correspondence with facts is wrong right from the very beginning, we should ask ourselves the simple question: 'Given a sentence whose truth is in question, *which* fact are we to pick out for comparison?' We cannot certainly compare it with *any* fact we like. Given the sentence 'The snow is white', we cannot compare it with the fact that the grass is green, or the fact that the milk is white, or the fact that the snow is cold, in order to ascertain whether or not the sentence is true. We have to compare the sentence with only that

fact which it states. But *every* sentence—and, therefore, the sentence 'The snow is green' *as well as* the sentence 'The snow is white'—states something, and whatever it states it states to be the case, to be the *fact*. (Note again that 'The snow is white' is equivalent with 'It is a fact that the snow is white'.) And there is never any lack of correspondence between the sentence and what the sentence says to be the case. There is, thus, perfect correspondence between the sentence 'The snow is green' and what it says to be the case, viz. *that the snow is green*, as much as there is between the sentence 'The snow is white' and what this sentence says to be the case, viz. *that the snow is white*. If we take a fact, from the world of facts, it is either stated by the sentence in question or it is not. If it is, it always corresponds with the sentence; if it is not, it is irrelevant. How can we, then, determine the sentence as either true or false by comparing it with a fact?[14] The nearest thing that we can do is this: we first find out what the sentence says, and then ask whether *that* is a fact. 'The snow is white' says that the snow is white; and so our question is whether that snow is white is a fact, or, what is the same thing, whether it is a fact that the snow is white. But we have already noted that it is a fact that Frege died in 1925 if and only if Frege died in 1925; likewise, it is a fact that the snow is white if and only if the snow is white.

If you have strong feelings about the traditional way of thinking about facts and correspondence, you may think at this point that I now take back with one hand what I gave you with another. I said earlier that we can talk of correspondence, and also of correspondence with facts; but what I am now saying, in effect, at least, is that there is no way of comparing facts with propositions, and that all talks about facts are talks about things. (The proposition that *that the snow is white is a fact* only says, *about the snow*, that it is white.)

But I do not really want to take back from the correspondence theorist anything that I had given him; what I want to maintain is that, although the basic intuitions in which the classical correspondence theory is grounded are correct, some of the traditional *articulations* of these intuitions are wrong. That these (theoretical) articulations are wrong is something which is brought out by their incompatibility with some other equally strong intuitions that we have, viz. the intuitions which sustain the equivalences we have noted a little ago. It is no part of my contention to deny (the existence of) facts. It is only a certain way of thinking about facts that I am arguing against. Some people would, in fact, say that I have conceded too much to the traditional idea of correspondence, by retaining the talk of facts. Davidson, I am afraid, will say that. So I must consider that point of view now.

V

In the chapter 'True to the Facts' of his book *Inquiries into Truth and Interpretation*, Davidson says that there are two distinct *strategies* which can be taken by the correspondence theorist. One is the strategy of facts, which is

the traditional, and the other is the strategy of satisfaction, which is Tarski's. The strategy of facts is open to various kinds of objection but *not* the strategy of satisfaction. But, still,

> The definition of truth in terms of satisfaction deserves to be called a correspondence theory because of the part played by satisfaction; for clearly what has been done is that the property of being true has been explained, and non-trivially, in terms of a relation between language and something else.[15]

There is no doubt that the definition in terms of satisfaction does capture a good part of those intuitions of ours which gave rise to the correspondence theory. One may, in fact, say that the basic intuition about correspondence is just this that, if a proposition is true (or false), then it is true (or false) due to the nature of the *things in the world*. A proposition says something about the things in the world, and, so, whether or not what it says is true depends upon how the things are in the world. One may go further and say that the definition of truth in terms of satisfaction captures not a good *part* of this intuition, it captures the whole of it: there is nothing to our *intuition* about correspondence which is not captured by this idea of satisfaction. But since propositions are very variegated in kinds, that is, in their respective structures, the relation of satisfaction does not obtain in the same manner in every case. If the proposition is true, then it is true because the things in the world satisfy it; but *how* they do so would depend upon the *structure* of the proposition, *which* varies from case to case. And that is why we require a *recursive* definition of satisfaction, i.e. a definition for the basic case first, and then, gradually building on it, definition for the more and more complex cases.

All this is true. But I do not think that this by itself rules out all talk of facts, not the kind of talk I have defended. If to talk about facts is to talk about things, as I have tried to show it is, we can again deploy the whole apparatus of satisfaction; and this would complete our bridging of the apparent gulf not only between the strategy of facts and the strategy of satisfaction but also between the old and the new ways of thinking about correspondence and about truth. It is the availability of such equivalences as the following which sustains my hope of bridging the gulf:

(1) Every infinite sequence of objects *f* satisfies 'Caeser crossed the Rubicon' *iff* Caeser crossed the Rubicon.
(2) It is a fact that Caeser crossed the Rubicon *iff* Caeser crossed the Rubicon.

For, together, they entail such equivalences as

(3) Every sequence of objects *f* satisfies 'Caeser crossed the Rubicon' *iff* it is a fact that Caeser crossed the Rubicon.

One may, however, wonder whether we have facts here only *nominally*.[17] Maybe that is what we do. But I want to maintain that, for the purposes of a theory of truth, we need not take a deeper plunge into the metaphysics of facts. The issue of the ontological status of facts should be settled elsewhere. What I have been trying to propound is a thesis which may be called 'the Principle of the Transparency of Facts', or, if that is too high-sounding, the idea of *unobtrusiveness of facts*.

Notes and References

1. Donald Davidson, *Inquiries into Truth and Interpretation*, Oxford: Clarendon Press, 1984.
2. Michael Dummett, *Truth and Other Enigmas*, London: Duckworth, 1978.
3. Now reprinted in *Inquiries into Truth and Interpretation*.
4. Alfred Tarski, 'The Concept of Truth in Formalized Languages' in *Logic, Semantics, Metamathematics*, Oxford: Clarendon Press, 1956.
5. See Definition 23 in 'The Concept of Truth in Formalized Languages', *Logic, Semantics, Metamathematics*, p. 195. It should be pointed out that, strictly speaking, this is not a 'definition'. The definition of 'a true sentence' should always be given in some particular language or other. We can perhaps call it a *schema* for a definition. But it serves our purpose by capturing Tarski's basic idea.
6. *Logic, Semantics, Metamathematics*, p. 155.
7. The point just made about the relation between object and metalanguage is rather tricky and controversial. One can argue that, even if the latter contains the former, the sentence which replaces *'p'* in the schema does so only in so far as it belongs to the metalanguage.
8. *Logic, Semantics, Metamathematics*, p. 153. The first italics mine.
9. *Ibid.*, p. 155.
10. *Ibid.*, p. 155.
11. Gottlob Frege, 'The Thought: A Logical Inquiry' in *Mind*, Vol. 65, 1956, reprinted in P.F. Strawson (ed.), *Philosophical Logic*, Oxford: Oxford University Press, 1967.
12. Michael Dummett, 'Can Truth be Defined?' in *Frege: Philosophy of Language* (2nd edn.), London: Duckworth, 1981, pp. 442-70.
13. Professor Kulkarni suggested in the course of the discussion that an alternative way of treating the infinite regress argument is to show that, although the regress is infinite, it is not vicious. It is true that this is a way of dealing with Frege's argument. But this is not quite an *alternative* to the reductionist strategy taken by Dummett. For, as a little reflection would show, the regress is vicious if and only if the reduction is not possible.
14. It seems that Strawson also had this thought when he said: 'Of course, statements and facts fit. They are made for each other.' See his 'Meaning and Truth' in *Logico-Linguistic Papers*, London: Methuem & Co. Ltd, 1971, p. 197.
15. 'True to the Facts' in *Inquiries into Truth and Interpretation*, p. 48.
16. This example is taken from W.V. Quine, *Philosophy of Logic*, New Jersey: Prentice-Hall Inc., Inglewood Cliffs, 1970, which contains an excellent exposition of a Tarski-style theory of truth. See especially pp. 35-42.
17. This term was introduced into the discussion by Professor Kulkarni.

Understanding science: a two-level reflection

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Introduction

The main objective of this paper is to establish that understanding of science involves two-level reflection. The failure to take this into account leads to the two extremes where philosophy of science is either reduced to logic of science or to sociology of science. In this paper, I have tried to reformulate the main controversy, and I have also tried to integrate the respective standpoints in a new framework. The new framework invoked by Husserl views history of science in a particular order, and shows how the mediation takes place between the theoretico-logical superstructure of science and its foundation or *Lebenswelt*.

Three Distinction

Any inquiry, whether natural or human, must start by recognizing the distinction between theory and its presuppositions. The distinction between these two does not imply that they oppose each other. On the contrary, they form a complementary whole in the sense that understanding of one requires understanding of the others.

Following this distinction one can proceed further and claim that the process of understanding involves a two-level reflection. At the first level, it implies the understanding of various phenomena and the associated regularities exhibited at different levels of reality, such as natural, social, cultural, etc. The understanding of these regularities is achieved through the manipulation of theories and ideal constructs. This results in the rise of large number of theories pertaining to different domains of reality. Theories are like networks through which we understand phenomena; and they, therefore, enter into our cognitive vocabulary as a *via media* between us and the phenomena. This constitutes the first level of understanding. The second level of understanding arises out of a specific intellectual need. A theory, whatever autonomy it may enjoy, can never exist *per se*. It must have a foundation or what I prefer to call presuppositions. At this level, the process of understanding takes a different course. It changes its order. From theory it goes to the presupposition of theory.

This two-level understanding leads to the two orders of inquiry, i.e. the first-order and second-order inquiry. The purpose of first-order inquiry is to describe, explain and understand reality through the construction of various

scientific theories; whereas the purpose of second -order inquiry is to understand the presuppositions of those scientific theories.

The relationship between these two inquiries and the manner in which mediation take place between these two has not been properly investigated. By and large, the second-order inquiry is relegated to philosophy, and its importance on the first-order inquiry has been hardly recognized. This is particularly true of natural sciences, where theory is seen and studies without any reference to its presuppositions. In the standard view, a theory is an idealization, and it exists *per se*. The concern for foundation is, therefore, not taken to be a legitimate scientific concern. The entire world of intersubjective experience in which science is rooted has been superseded by the objectively true and valid universe of science. What counts as real is the theoretico-logical superstructure of science. This results in an alienation of theory from its root which causes what Husserl calls crisis in science. It is a crisis, because the entire meaning of science is lost in the process of constructing an autonomous universe of science.

Science and Form of Life

The alienation of science from its roots has been recognized in recent times by people belonging to various traditions of thought and research. Researches in the philosophy and sociology of science have shown the myth of the earlier or the positivist conception of science, according to which aim of science is to attain ideal objectivity, 'an ideal that subjects all scientific statements to the test of impartial criteria recognising no authority of persons in the realm of cognition.'[1] This view has been challenged, and a new move has been taken which tried to discover the historical contingency of scientific paradigm. The Popper-Kuhn controversy in the philosophy of science in this respect deserves special mention. Karl Popper, one of the principal exponents of the conventional view, argues that the growth of science follows a cumulative pattern. That is to say, science progresses step by step and is guided by its internal logic, which is independent of any social basis. Kuhn challenges this view.[2] For him science can be of two types: normal science and revolutionary science. Normal science consists of the articulation of the existing paradigm to which the scientific community is committed. Scientific revolutions, on the other hand, are non-cumulative which replace 'older paradigm in whole or in part by an incompatible new one'. According to Kuhn, the shift of paradigm depends on various historical, sociological, and even psychological factors. The strict sense of objectivity can, therefore, no longer be maintained in science. Similarly, in some of the works in the sociology of science and, particularly in the Marxist tradition of thought, the conventional view has been challenged. As a result, the new awareness came, and that is the awareness to rediscover and redefine the foundation of science. Science is no longer considered to be an autonomous force. People feel that science is essentially social and it represents what Wittgenstein calls a 'form of life'.

The Two Extremes

The post-positivistic philosophy of science roughly takes two directions.[3] The first which is philosophical rejects the earlier notion of scientific rationality, and, instead, advocates a notion of rationality which does not require a cumulative history of science. This, in other words, is to advocate a new and richer notion of scientific rationality. This view, therefore, argues that what natural science requires is not sociological account but rather a redefinition of scientific rationality.

Larry Laudan is one of the principal exponents of this view. His *Progress and Problems* is a significant contribution in this line of thinking. One of the important points that he has made is that there is no sharp boundary between science and non-science. A good method in science should be regarded as a good method any where. Thus, from the point of view of good method, physics and theology can both stand on the same footing, because both employ the same method for correctly pursuing their cognitive aims. So, in this view, the term 'scientific rationality' is basically meant to follow the scientific method, and it is the same method for all.

Now, what is called for is a guideline or a methodological principle, which will tell the historian how to approach individual cases in the history of science. To this effect, Laudan offers what he calls a *rationality principle* which suggests that, if a belief can be explained as rational on the ground of the evidence available, then that should be accepted as the correct explanation. This position is not really different from those of his predecessors. But, unlike his predecessors, Laudan goes further and introduces a clause to his main thesis which says that, when such rational explanation is not available, we should try to account for the beliefs by the social causes. As Laudan says:

> ...the sociology of knowledge may step in to explain beliefs if and only if those beliefs can not be explained in terms of their rational merits Essentially, the arationality assumption establishes a division of labour between the historian of ideas and the sociologist of knowledge; saying, in effect, that the historian of ideas, using the machinary available to him, can explain the history of thought in so far as it is rationally well-founded and that the sociologist of knowledge steps in at precisely those points where a rational analysis of the acceptance (or rejection) of an idea fails to square with the actual situation.[4]

One should not think that in this view sociology does not come in the forefront of the explanation of rational belief. Sociology is required only when there is deviation from the standard rational path, or, to use Newton-Smith's phrase: 'Sociology is only for deviants.'[5]

The other direction in which the study of science proceeds can be described as overtly sociological in character. Its claim is much stronger than the earlier sociological view of science which, merely recognizes the importance of social factors for having a complete account of science. But the recent standpoint, as upheld by the Edinburgh school of sociologists of knowledge, is that not only social factors are always present but they are the determining factors in science. In the literature, this is known as *strong programme*.[6] One of the paradigmatic examples of such programme is Paul Forman's work entitled, *Weimar Culture and Causality*. The main purpose of this work is to explain in purely sociological terms the decline of causality in physics and the consequent development of a causal quantum mechanics in Germany. Forman argues that after the World War I the intellectual climate and the public sentiment in Germany were hostile to science and technology. There was a general frustration among people, and the anti-rationalists ideas became popular. German public were in direct opposition to the spirit of science which was seen as mechanistic, rationalistic and causalistic. Spengler's *Decline of the West*, as Forman regards epitomizes this intellectual crisis of Germany. For Spengler mathematics and physics developed in the West expresses the 'Faustian' nature of contemporary Western culture. Physics, mathematics, causality and rationality are all brought together at one level, and are linked to death. The only hope against this, as Spengler says, is to accept the thing called 'Destiny' which is living and creative. Living under this cultural crisis the prominent scientists of Germany of that time, such as von Mises, Weyl, Born and others were influenced by this fatatistic view which Forman calls 'capitulation to Spenglarism'. This 'capitulation to Spenglarism', as he argues, is the determining factor in the rise of non-deterministic physics, which was passionately defended by the then German physicists. Such passionate defence of non-deterministic physics, as Forman concludes on the basis of his extensive sociological study, does not involve any rational enterprises. To quote Forman:

> I contend...that the scientific context and content, the form and level of exposition, the social occasions, and the chosen vehicles for publication of manifestos against causality, all point inescapably to the conclusion that substantive problems in atomic physics played only a secondary role in the genesis of this acausal persuasion, that the most important factor was the social-intellectual pressure exerted upon the physicists as the members of the German academic community.[7]

As we see, we are now confronted with two competing views regarding philosophy of science. The one holds a trans-historical norms of scientific rationality with the admission that socio-psychological modes of explanation will be introduced whenever the standard rational explanation fails. The other holds that there are no norms of scientific rationality which are of trans-historical status, and the socio-psychological modes of explanation should be

invoked for understanding a particular episode in the history of science. The former can be described as the rational, and the latter can be described as the social view of science. But these two extreme views create an unresolvable situation. It is unresolvable, because the philosophers and the sociologists of knowledge have seldom tried to understand the exact relationsip between rational and social. They have rarely attempted to relate both rational and social factors in constructing historical explanation of particular events.[8] The relation between rational and social is not antithetical. They have to be seen as complementary to each other. Failure to recognize this complementary relationship will invariably result in the extremes, i.e. philosophy of science will be either reduced to logic of science or to sociology of science.

In order to understand the exact relationship between rational and social, we need to reformulate the entire debate between the philosophers and the sociologists of knowledge. For this we need a new framework of understanding in which science will be understood neither solely as logic of science nor as sociology of science. It will be a framework which will distinguish the theoretico-logical superstructure of science at one level and its foundation, presupposition or structure at the other. The primary focus of this frame work will be to study the interaction between these two. This suggests that understanding of science involves what I have called the two-level reflection. In the following pages, I shall briefly elaborate this theme. In my analysis, I have been influenced considerably by Husserl's work, particularly his work on the crisis of Galilean science and origin of geometry.[9]

The New Framework: A Preliminary Note

The purpose of this new framework will be to redefine the meaning of science through a study of its foundation. The kind of study that I shall initiate here is different from that of the sociologists of science. My basic attempt will be to show how the original meaning of science was lost through the period of its subsequent development. This deviation from original meaning is what I would call the original sin of science. The sin is the systematic rejection of the idea of 'reason', according to which 'reason' is both subjective and objective, theory and praxis; and, therefore, is an instrument for changing the world in accordance with man's rational faculties and ends. But 'reason' as constituted in science is reduced to paradigmatic rules of deductive inference. Scientific rationality is divorced from the *rational humanitas*, and becomes a technological rationality without having any 'end' or 'telos' of its own. Galileo has never asked for the validity of the foundation of mathematics and its extension to natural science. For him this whole question is irrelevant since mathematics justifies its own foundation. In other words, mathematics is the science of the self-evident. Thus, science, as Herbert Murcuse observes, 'contained an unscientific foundation'.[10] The sociologists of science do not talk about this original sin of science. On the basis of the inadequacy of the conventional

view, they try to show the sociological and historical roots of science. This, indeed, provides a new perspective to the foundation of science. But this is not enough. One must see that the connection between theoretico-logical superstructure of science and its foundation is not a matter of empirical coincidence of fact alone but is a theoretical necessity. In other words, this connection is not just an external or sociological one but something which is concerned with the very structure and meaning of science. The basic issue, here, is not the external relationsip between science and society but the internal conceptual structure of science itself. This, as I have already stated, is that 'reason' in its original states demands such connection. Modern science is a fall from that state, and, therefore, there is a crisis in science. This takes us to the historical development of science. The new framework views the conceptual development of science in three successive phases into which I shall go now.[11]

Science as a New Awareness

The first phase of science starts with Descartes approximately from the middle of the seventeenth century, and it extends up to the middle of the eighteenth century. In his *Meditations on First Philosophy*, Descartes first tries to provide a sure foundation for, and a validation of, the new sciences. For Descartes the universe as it appears in experience does reveal its real nature and structure. The real nature of the universe, as Descartes claims, should be uncovered in exact mathematical terms. This poses a sharp contrast between appearance and reality, a reality that is conceived and constructed in mathematical physics. Descartes tries to justify this appearance-reality distinction by appealing to a principle, which claims that whatever is clearly and distinctly perceived is true. Mathematical knowledge, particularly geometrical conception of the external world, as Descartes claims, justifies this principle. This marks the beginning of a new way of thinking, and is thus a land mark in the history of the conceptual development of science. One is aware of the fact that mathematical knowledge can provide a sure foundation to science. Science now starts as an independent inquiry, which no longer needs only justification or validation. This brings us to the second phase.

Science as a Fact

This phase started in the year 1748 with Leonhard Euler, the great Swiss mathematician. In his famous monograph, *Reflection on Space and Time,* Euler discusses the concept of absolute space, absolute time, and absolute motion. In this scientific treatise, he makes certain claims which call for a radical change in our philosophical thinking. Euler agrees that philosophers must continue to discuss the fundamental concepts of physics, but which concepts are to be regarded as fundamental is a decision to be taken by the physicists and not the philosophers. In the matters of scientific knowledge,

which is consequently identified as the only mode of knowledge, one must accept the supermacy of physics rather than philosophy. If a physicist, for example, thinks that for the proper formulation of the laws of dynamics and laws of inertia one requires a formulation of absolute space and time, then the inclusion of these notions should be accepted as valid. The validity and justification of these notions should be understood within the theoretical context of physics. Consequently, in such matters, philosophers do not have any independence; they must accept the decision of the physicists as final, and proceed accordingly. This gives rise to a new conception of philosophy of science which is known as logic of science.

The above discussion shows that science does no longer need any justification. Its validity is taken for granted, and thus science becomes a fact. That science is a fact is the central feature of the positivist world-view. A new culture along with a new concept of rationality comes into existence. Consequently, this phase of science as a fact raises certain problems which reflect a crisis in the foundation of science. This marks the beginning of the third phase, which Husserl calls science as a problem.

Science as a Problem

Science as a problem is the third stage in the conceptual development of science. It signifies certain basic changes in the internal structure of science. Modern science, or more appropriately the physicist's programme of the mathematization of nature,[12] exhibits a structure that is similar to the structure of a machine. In other words, the entire procedure of modern science can be better understood in the sense of a logical machine, which implies the algorithmic procedure used for the formalization of mathematics. These algorithmic procedures are purely mechanical in the sense that they can be applied in an absolutely routine manner. Methods of science, since they are rigorously formalized, assume the same character. This results in what is known as 'technization of science', which implies the mechanical application of scientific rules.[13] Science can, thus, be compared with a machine, which can be handled by any one who knows the rules of the operation of the machine. This gives an instrumental character to the very structure of science. By the *logos* of pure science one now understands only technology whose purpose is to serve some external ends.

Here, at this stage, a basic philosophical question concerning the machine itself arises. For a philosopher the actual functioning of the machine is not of great interest. He goes beyond this, and inquires about how and why this machine functions. That is to say, from the functional aspect he goes to certain foundational aspects of a machine. They are: the machanism which makes functioning of a machine possible; the principle by which the machine is constructed; and, finally, the condition in which the entire construction is conceived. These philosophical activities clearly show the distinction between the

machine and the presuppositions of a machine. On the same grounds a distinction can be maintained between Galilean science and the presuppositions of it. These presuppositions are like the underlying structures from which science derives its sense. They indicate the manner in which modern science becomes possible. This, in other words, is to define the meaning of modern science in its entirely. But one who adopts the view of a technician of science understands science without its presuppositions and foundation. In such a view, philosophy of science is confined to the study of the mere logic of science. The study of the logic of science has its merit within the theoretico-logical superstructure of science. But it does not constitute the whole of science. Being a superstructure the universe of science requires a foundation upon which it rests and upon which it is constructed. The foundation is the common social experience or what Husserl calls *Lebenswelt*. A comprehensive study in philosophy of science will be possible only when it is able to take these two (i.e. theory and its foundation) together. I shall now give a brief description of the mutual interaction of these two, and shall argue how an objectively valid scientific theory evolves essentially through a common a theoretical knowledge constituted in *Lebenswelt*.

Lebenswelt AND ATHEORETICAL KNOWLEDGE

The *Lebenswelt* is a pre-given world which exists independently of and prior to all scientific activity. But it pervades all our activities in the sense that it enters as a premise or presupposition of all our activities. This pre-given world includes nature which is not the idealized nature of physics. It is nature as given in direct and immediate experience. It is this pre-given world into which we are born, and at every moment we are aware of the fact that we are within it. We also find that we are surrounded not only by natural things, e.g. colour, shape, size, weight, etc. but also instruments, books, objects of art, and so on. These objects have human significance in the sense that they serve human purpose, desires, and need. Besides objects, we encounter within *Lebenswelt* our fellow-men, and we find that we stand in diverse relation to them. We take it for granted that our fellow-men exist in the same way in which we exist, and that they confront the same thing and the same object as we do. The only difference is that depending on our standpoints the objects appear with their varying aspects. This realization that the world is one and the same for all constitutes the core of our social knowledge or atheoretical knowledge.

Following Husserl certain predominent features of *Lebenswelt* can be spelt out. First of all, the world of common experience is extended in space and time. This provides a frame of reference in which items of experience can be related and described in spatial and temporal terms with one another. Furthermore, things exhibit some kind of spatial forms, and they are also grasped accordingly. Trees, for example, present a cylindrical shape. This, of course, should not be understood in a strictly geometrical sense. The phrase

'cylindrical shape' actually refers to a physiognomic aspect of spatial forms. It refers to a spatial configuration within which variation takes place.

Secondly, we find that there are various kinds of regularities exhibited at *Lebenswelt*. We experience various changes, and try to establish a regularity among these changes. The alternation of day and night, changes of season, for example, indicate a simple type of regularity. Again, people know without knowing science that water boils when heated and after a point it evaporates; or a stone falls down when dropped from the hand. This means that we know that events do not take place in isolation. Events are co-ordinated in a certain manner. Therefore, occurences of one type are regularly followed by occurences of another type. This is the idea of universal causality,[14] which is embedded in the practical life of our day-to-day existence. The idea of universal causality is the basis of our everyday conceptualization by which we anticipate the future, and regulate our future course of action for the desired result. Anthropologists like Levi-Strauss have emphasized this aspect of social knowledge when they talk about rational behaviour of primitive man. On the basis of everyday causal connection, primitive man within his own framework provides a rational explanation for various phenomena.

The third feature of common social knowledge is that it is perspectival in character. By perspectival it is meant that things in the *Lebenswelt* appear as relative with respect to the human subjects. The same object may be perceived by us from our respective points of observation. Intersubjective agreement is brought about in order to make adjustments in these different perspectives. As a result, we find that we live in the same world of common experiences having the same intersubjective knowledge. However, a degree of relativity exists; but it exists not with regard to individual but with regard to social groups.

These three features constitute the core of our social or atheoretical knowledge. They are the basic co-ordinates of man's thinking. Atheoretical knowledge is the rudimentary form of conceptualization through which we comprehend and explain the world. Since it is atheoretical, the nature of this knowledge is vague, inexact, and indeterminate; but nevertheless it is the basis of man's mental operation in the everyday world. Theoretical pursuit evolves through this atheoretical knowledge with the purpose of making knowledge clear, exact, and determinate. In a similar way, theoretical pursuits in science should be seen and understood with reference to the theory-atheory matrix which I shall now discuss.

SCIENCE AND THEORY—ATHEORY MATRIX

Scientific activity is not an isolated abstract activity of the scientists. It is rather a collective activity in which scientists depend on each other and interact with each other. For example, Einstein, as Husserl points out, in his general theory of relativity relies upon Michelson's experiment. Now, when

Einstein refers to the work and results of Michelson, he obviously does not take Michelson as the innovator of the psychophysical construction which stands on an objective ground. For Einstein, and for that matter any working physicist, Michelson appears as a collaborator who lives in the same world, who shares with him certain interests and who is engaged in the research pursuit. Thus, the two working scientists when they meet find that they have some common purpose, and they share the general orientation of thinking. This means that one finds oneself in communion with others. Both try to understand and appreciate each other's ideas. They criticize each other and suggest modifications. That is to say, a dialogue situation is established between the two. This establishes a community of scientists which comprises not only the present scientists but also the predecessors whose works provide the basis of the present scientific work. This community is also an open community in the sense that the present work will be carried on by the future generations. Science evolves through the communication of the members of the community of scientists. The communications consist of general debate, mutual criticism, correction and so on. Science in this sense is like a cultural activity with the practice of a special kind which Husserl calls 'practice of theorizing'.

For the proper understanding of science, one must take account of the mental operations and the way in which these operations are intersubjectively interlinked in science. Natural science in this sense is closely connected with human science which studies the mental life of man.

Modern science or Galilean science seeks to discover a hidden, objective nature behind the appearance of *Lebenswelt*. Galilean science claims that the objective nature construed by the scientists is the reality, whereas the perceptual world is the appearance. Thus, the objective nature portayed in the scientific theory replaces the perceptual world. This creates an alienation between scientific theory and perceptual world. But this is essentially a wrong way of looking at science. Whatever the development of science may be, the perceptual world always remains to be familiar to us. Both the scientist and the layman observe and appreciate the beauty of nature in the same way. This shows the primacy of the intersubjective world of experience. Scientific theories are ultimately verified by observations; and, even if observations are meant to be pointer readings, they are still perceptual experiences. The notion of 'objective nature' should be conceived as an idea which is an intersubjective accomplishment, and it inspires the members of the community of scientists, to produce their work. These products are the scientific theories which mark the historical development of science.

Scientific activities, like other cultural activities, are carried on in *Lebenswelt*. Scientific problems arise within *Lebenswelt*, and then they are singled out and abstracted. To the scientists, the laboratory, the computer centre, the workshop, etc. in which they conduct their researches have human significance. It has human significance, because it serves certain human purpose. A scientist views all these, i.e. the laboratary, the computer centre, the workshop, etc., with reference to activity which has human end.

Scientific activity should be, therefore, seen as one among the several modes of our collective activity. Like other activities it has a purpose. Its purpose is to enlarge atheoretical knowledge of the intersubjective world. Science, in that sense, replaces the inexact knowledge of our everyday world by exact knowledge.

Towards a Genetic Methodology

The description of science as theory-atheory matrix leads to the view that a proper understanding of science requires a genetic investigation, and, therefore, the method to be used for this is a genetic method which should be carefully distinguished from the historical method. The genetic method, although it relies on historical knowledge, is not by itself a historical method. It is, on the other hand, a logical method which seeks to discover the logic of the genesis of different meanings and, particularly, scientific meaning. The role of history in this respect is to show how theoretical networks of meanings have a history. If it is accepted as datum that meaning have a history, then the task of philosophy of science is to explicate the logic of their historics.[15] Its purpose is to explicate the various systems of meanings and to show how these systems are related to one another by virtue of being systems of meanings. Accordingly, it is possible to show in this framework how an abstract formalized system of meaning can be logically related to what Husserl calls 'protological' systems of meaning operative in man's perceptual world of *Lebenswelt*.-- But this does not suggest any reductionism, i.e. reducing the formal systems into perceptual ones. The objective of genetic inquiry, on the other hand, is to show how the formal system belonging to the objective order of science is related to the systems of meaning functioning in the subjective order of perception.

The central focus of genetic methodology is to restore the role of human subject in science. The basic fallacy of the positivistic methodology is that, in its ambition to make science objective it undermines, if not rejects, the role of percipient subject, viz. his truths of perceptions which provide the raw material to science. This is similar to Kant's idea of Copernican revolution which attempts to bring human subject to the centre, so that, instead of subject being conformed to object, object should now onwards conform to subject. In this conception, as I have already indicated both subjective perception (atheoretical knowledge) and objective truths of science (theoretical knowledge) will have their own respective places in a single unified continum of human understanding. Secondly, the so-called objective truths of science will then no longer be treated as alien to human subject but essentially as accomplishment of the percipient subject.[18] Thereby they will regain their human significance. Finally, these changes in the internal structure of science will lead

to the development of a *metacritique* that will examine the very conceptual basis of science.

We can now see how science is built at a superstructure on the foundation of atheoretical knowledge. Science is not a departure from this world. The intersubjective world or *Lebenswelt* does intervene in the elaboration of science. The practice of theorizing is a specific human activity, which is rooted in the atheoretical knowledge and is also influenced by it. If this connection is not seen, then science becomes like a machine-an alogarithm which is to be followed in a routine manner without having any understanding of meaning. In this respect, Husserl's work, *Origin of Geometry*, deserves special mention. Through this study he establishes the link between theory and atheory in geometry.

Origin of Geometry and Theory-Atheory Matrix

In Husserl's view, Galileo accepts geometry as the foundation of his programme of mathematization of nature. Galileo thinks that geometry provides the ideal of true knowledge; and, therefore, if science of nature is possible at all, it has to be on the pattern of geometry. But Galileo, as Husserl points out, never tried to justify geometry as the body of true knowledge, nor did he think that geometry needed any justification. He takes the Platonic attitude towards geometry, and thereby accepts the fundamental dualism of Greek thought, namely, the dualism between *episteme* and *doxa*. Geometry being the science of *episteme* is self-evident; and, therefore, as a body of knowledge it needs no justification. Husserl considers this a prejudice. Geometry does require justification, and its justification lies in *Lebenswelt*.

Husserl gives an elaborate justification by going into the origin of geometry. In essence his thesis is: geometry as idealized knowledge is basically rooted in the art of measurement practiced by men in the *Lebenswelt*.[19] This activity, i.e. the activity of measuring, is primarily governed by the pragmatic motives of man. That is to say, the purpose of this activity is to attain varying degrees of accuracy. It is through such activity that a carpenter, for example, transcends the horizon of practicality and attains some ideal notions, such as the idea of planeness or straightness in his system of understanding. These ideas are taken as ideals of perfection. They form the science of idealities or geometry that represents the ideals of *episteme* of the Greek thought.

In his search for the origin of geometry, Husserl is not interested in any 'philological-historical' inquiry, such as, to discover the first geometer who actually uttered geometrical propositions.[20] He is, on the other hand, interested to find out the 'most original sense in which geometry arose' that makes its forward movement possible resulting in an important tradition in the cultural life of man. Husserl's inquiry, as he himself claims, is a regressive inquiry going back into 'the submerged original beginnings of geometry'. The inquiry

is like the method of back-tracking which seeks to retrace the conceptual decisions and conceptual landmarks of geometrical traditions.

Geometry as science presupposes a tradition which may be defined in the light of certain theoretical activities of man which must have a historical beginning. As a tradition, it arose out of a first acquisition, i.e. the first creative activity of man. Later it moved forward from one set of theoretical development to another. In this progression of it movement, the developmental stages are not isolated pockets of change; they rather indicate a continuous synthesis, and thus make a unitary conception of tradition possible. The meaning of geometry should thus, be, understood in the perspective of this continuous development, i.e. 'first as a project and then in successful execution', as Husserl says.

The method of back-tracking in geometry suggests that the entire process first starts with the inventor, such as, Euclid or Pythagoras. Its meaning lies within the mental space of the inventor. But geometrical propositions, as we all know, do not exist within the inventor's personal sphere of consciousness. They have an objective existence in the sense that they are meant for everyone. They assume a form of ideal objectivity, or, as Husserl says, they are supertemporal. It may be noted that the ideal objectivity of geometrical theorems which is expressed through language retains its character all through, no matter how many times it is sensibly uttered or translated in different languages. In each instance, it is the same.

We are now left with two distinctions. The first is the linguistic utterance which has spatio-temporal individuation, and the second is the thematic content of the linguistic utterance, i.e., meaning. The thematic content refers to the ideal objects of idealities of geometrical propositions.

Now the problem that confronts us concerns the ideal objects of geometry. The precise nature of the problem is: 'How does geometrical ideality proceed from intra--personal origin to its ideal objectivity?'[21] This is, of course, achieved through language; but then the next question that threatens us is: how does a linguistic expression which originated in intra-subjective situation become an objective expression which is understandable by all?

An answer to this, as Husserl thinks, must presuppose a notion of common language and common civilization. Being in this world we are always conscious of this world as the 'horizon of our life', as a 'horizon of things', etc. In this world horizon, there is the horizon of our fellow-men with whom we are constantly interacting. There is a reciprocal relationship and reciprocal understanding between me and others. To elaborate, I understand others as not different from me; and I, therefore, consider them as *my others* with whom I can enter into different relationships. The same is true of others also. We came to know each other through the process of empathetic understanding. A common civilization in the sense of a community of living is thus formed.

It is through this common civilization that the idea of common language

arises. One of the primary ways through which I am aware of this civilization is language. We can talk about the things which are objectively existing within this world. Everything in this world can be described through language, and they are namable. Language, thus considered, is related to the objects of the world which are linguistically expressible.[22]

In the light of these two presuppositions, we are now in a position to explain how geometrical propositions become objective. Husserl's argument is that something may be psychic; but, if it can be understood by others and if its content is communicable, it becomes *eoipso* objective. It may thus be regarded as one of the real things of the world which are experienceable and namable by anyone. This implies that a broad agreement is achieved among people over these objects. Similarly, sentences used for the description of these objects are all verifiable sentences based on our common experience.

The ideal objects of geometry should be understood in the same way. The original state from which geometry starts is its first production which is self-evident. It does not have any objective existence; it assumes a passive state. However, this passive state opens up the possibility of an active state, a state of recollection of what is produced first. The originally conceived self-evident production is recollected or renewed in the subsequent stages in the history of geometry, and thus a chain of repetitions is formed throughout. In all these stages of repetitions, an identity is maintained with what is produced in the original state of self-evidence.

This entire chain of repetition of self-evidence in geometry presupposes a reciprocal linguistic community. The understanding of the original production by the others and its identical repetition is possible because of common language. A communication link is thus formed between the different stages of repetitions; and the repeatedly produced structure becomes a structure common to all. This provides the basis for the ideal objects in geometry.

Equally important in this context is to show what Husserl calls 'the persisting existence of the ideal objects'. The characteristic feature of the ideal object is that they continue to exist independent of their inventors and followers. Husserl thinks that this is possible because of written communication, which does not require to take any 'personal address' into consideration. This, in his view, makes communication, virtual ,and thus 'communalization of man is lifted to a new level.'[23]

Finally, we come to the problem of how to explain the new development in geometry. Husserl seeks to show that there is a peculiar movement in geometry where the new results are attained on the basis of the earlier one, and that the newly achieved results after a point become 'in turn, the foundation on which the next set of results are arrived at. Thus, the presupposed pattern in the movement is that each stage of the thematic development in geometry is grounded on the previous stage, or, to put it, in Husserl's characteristic phrase, 'meaning is gounded on meaning'. The result is 'from idealities more and more idealities at higher levels are produced'.[24] For Husserl

therefore, the method of geometry is basically meant to be a method of explication which involves:

> ..extracting one by one, in separation from what has been vaguely, passively received as a unity, the elements of meaning, thus bringing the total validity to active performance in a new way on the basis of individual validities. What was a passive meaning-pattern has now become one *constructed* through active production. This activity, then, is a special sort of self-evidence.[25]

The notion of explication conceived here is different from the Anglo-Saxon notion of explication as used by Carnap and others. Explication in geometry does not mean clarification of meaning only; it is also meant to be deepening and enriching of meaning This is evident from man's theoretical activities. Human beings are not passively conscious beings; they are actively engaged in discovering the new horizons of the world. Man has the indomitable desire to know, and this leads him to create new meanings.

My purpose here is not to give an elaborate presentation of Husserl's analysis of the origin of geometry through this rather over-simplified exposition. I have only tried to show that this is perhaps a very significant way one can see idealization or axiomatization in science as part of man's atheoretical knowledge of the world. The purpose of idealization is meant to interpret the physical world, and it should, therefore, never be mistaken as reality itself.

I have started my paper with the distinction that understanding involves a two-level reflection; one is associated with theory and the other with presupposition or foundation of theory. Accordingly, there are two orders of study pertaining to the two domains. Understanding of science can be best achieved, if we employ this method of two-level reflection. It is only through such method of understanding that science can be complete and comprehensive. As we have seen, philosophy of science and sociology of science adopt two extreme attitudes towards the study of science. In this paper, I have tried to reconstruct this debate, and I have tried to integrate their respective standpoints in a new framework. The new framework invoked by Husserl views history of science in a particular order, and shows how the mediation takes place between the theoretico-logical superstructure of science and its foundation or *Lebenswelt*. This is what I mean by the phrase: 'Understanding science: a two-level reflection.'

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The value-ought of self-realization: a phenomenological approach

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The present paper is an attempt to approach the principal Upaniṣads from the phenomenological point of view in order to reconsider the concept of self-realization as the value-ought. By dealing with the concept of self-realization in the phenomenological way, I do not wish to suggest that this is how they appeared to the Upaniṣadic *ṛṣis*. The explicit aim of this study is to clarify the terms and concepts used in the Upaniṣadic texts, and to submit them as far as possible to a phenomenological analysis.

Let us begin by identifying the apparent opposition between two fundamental concepts of the self.[1] The one concept is the outcome of the naturalist approach to the self characteristic of objective natural science; the other concept is the outcome of a purely reflective approach to the self characteristic of Husserlian phenomenology. The naturalist begins with the objective natural world, and regards the self as merely another natural being to be understood in terms of the causal laws that relate its behaviour to other natural events. The naturalist does not admit categories to understand the self. The phenomenologist, on the other hand, begins with the conscious self, and regards both the self and the natural world as horizons of experience to be understood in reference to the intentional acts of the self. He, therefore, admits irreducible categories of intentionality to understand the self. Causal explanation of the self is fundamental to the naturalist, whereas the reflective analysis of intentional acts is fundamental to the phenomenologist. Consequently, phenomenology is in an excellent position to unravel the complexities that are involved in the concept of self-realization as the Upaniṣadic value-ought. The reason is that phenomenology studies the concept of self-realization by describing how one feels to be in an 'Ātmanized Absolute'.[2] Hence this approach not only fulfils the demands of presuppositionless investigations but also examines the most direct and private data about ātman (self), body, world and the human existence to which we have access. Phenomenologically, ātman (self) becomes relevant to the human condition and existence, and is to be understood in terms of our experience of ātman. Thus, the phenomenological approach would reject as a point of departure the commonly accepted sharp distinctions among self, body and the world. It endeavours,

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instead, to discover that integral concrete human experience, of which the notions of 'self', 'realization' 'absolute unity' and the like are abstractions.

When we consider the Upaniṣadic passages in which the seers advocate the 'transcendent' and 'distinct' character of self-realization, we understand that they have returned to the immediate realm of the lived experiences. This 'lived experience ' includes the individual's feelings, desires, emotion, cognition, will and the like; but it is not fully confined nor described in terms of feelings, desires, and emotions. It is the dynamic interplay of one's felt needs, urges, desires. wishes, interests, cognitions, emotions, attitudes and the like. Man undergoes this 'lived experience' because the innermost reality of himself is the ground of all his experiences. It may best be described phenomenologically as the that which I am non-focally aware of at a moment. Let us explain.

In all experiencings of the objects—mental and physical—the objects become the focal point of our awareness, whereas in the question of self it is the essential subject for all our experiencing of the psychical events and physical objects. That is, the self is the that which we are non-focally aware of at particular moments while we experience the objects. *Bṛhadāraṇyaka Upaniṣad* illustrates the same viewpoint in the following words:

> As, when a drum is being beaten, one would not be able to grasp the external sounds but by grasping the drum or the beater of the drum the sound is grasped; as, when a counch-shell is being blown, one would not be able to grasp the external sounds, but by grasping the counch-shell the sound is grasped; as, when a lute is being played, one would not be able to grasp the external sounds, but by grasping the lute or the player of the lute the sound is grasped—so by comprehending Ātman or Brahma everything is comprehended.[3]

It is said in *Chāndogya Upaniṣad* that through the grasping of this subject—self—'whereby what has not been heard of becomes heard of, what has not been thought of becomes thought of, what has not been understood becomes understood.'[4]

The above elucidation suggests that a close analysis of experience reveals that the self is the pure subject to whom the mental facts and physical objects are 'given'. Every experience, thus, reveals not only the object which we experience but also the essential subject as the abiding core of all our experiences. In *Chāndogya Upaniṣad,* we have a conception of self and its realization on the above lines. Five learned householders, greatly learned in sacred lore (*śrotrīya*), came together and discussed: 'Who is our *ātman*? What is Brahman?' These five decided to resort to Uddālaka Āruṇi who had the reputation of understanding that universal *ātman*. But he was reticent. The six then approached the famous Aśvapati for instruction. Aśvapati elicited from each his conception of universal *ātman*. One said that he venerated the sky as the universal *ātman*. Aśvapati commended the conception and gave assurance that he was shining like the sky but a great deal more. The others in their turns enunciated their conceptions, all of which were accepted as true but taken as totally false. Finally, Aśvapati taught the six Brāhmaṇas the noble truth about the universal *ātman* as no other than their own selves. In conceiving of *ātman* as something apart from themselves, they were committing an error.[5]

Such approaches are evident in King Janaka's search[6] and Naciketās' inquiry.[7] Consequently, this 'self knowing' on the phenomenological view is constituted by the ability of the self to relate its actions to the unity of its consciousness and to acknowledge the actions as its own. Thus, the actions of the self are fulfilments of conscious intentions. They do not merely exhibit its originally determinate nature, on the contrary, they determine its nature.

This point can be pressed as follows. The ought-value that inheres in self-realization is achieved by an individual when through action he sees through his *jīva* nature and passes on to the transcendental that is the *paramātman*. Through action, at the first stage, the full nature of *jīva* is apprehended. In the second stage, this full knowledge of *jīva* leads through an understanding of its background and conditions to the self that is beyond the empirical self. In this way, the identity of the empirical self with transcendental self is fully realized. This unison is experienced as the climax of action and the highest point of fulfilment. That is to say that the empirical self opens to itself, and, in fact, this 'reflexivity' ultimately brings it face to face with *paramātman*, the transcendental self.

The important aspect of openness, therefore, is that it renders the self (*jīvātman* in Upaniṣadic terms) receptive to principles, norms ideal categories, etc. We encounter here an interesting parallelism within the self. That is to say that the openness of the self has two dimensions: one towards the world—intentionality; and the other towards himself—intensionality. The first sees the physical objects and psychical events as significant realities. The second sees himself as realizing of principles, norms and ideals. Hence *jīva's* openness in the first case is exhibited in its experience, and experience becomes a concrete feature of *jīva*. In the second case, *jīva's* openness is manifest in the act of reflection.

Openness to one's own self, therefore, is not simply a given fact but a disclosure of the empirical self. Thus, from the phenomenological point of view, self-realization is not merely a natural event to be observed from an external perspective; on the contrary, it is a persent and future possibility in relation to which the empirical self opens itself to itself and thereby becomes capable of making the whole of its being its own. A trivial example may illustrate my point. My frequent exhibition of bad temper may well be a conscious experience, but it is not yet the consciousness for me that 'I am bad tempered'. Reflection on this self-consciousness when achieved discloses the

possibility of choosing either to be bad tempered or to be cured of this failing. This advance in reflection may well be considered as the beginning of openness to myself. Openness to one's own self, therefore, alters what was there before. In virtue of my developing this openness, I achieve at least a measure of understanding/realizing myself. Openness to one's own self, therefore, means to be involved in, engaged in, concerned about and affected by the experience that is evoked by the self. Hence the precept of the Upaniṣadic truth—'Everything in the world is of value as leading to the realization of one's self'—finds confirmation as the 'ought' for a healthy life.

These considerations on the phenomenology of self-realization shows that *paramātman* as the transcendental self is the passive observer and *jīvatman* as the empirical self is the active constituter. Thus, *Śvetāśvatara Upaniṣad* depicts the transcendental and empirical self in the following way: 'Two birds, fast-bound companions, clasp close the same tree. Of these two, the one eats sweet fruit; the other looks on without eating.[8] On the basis of this Upaniṣadic text, it may be understood that the transcendental self is a non-experienced locus in empirical consciousness, and that locus is and remains as the ultimate subjectivity. Consequently, the language of objectivity cannot legitimately make reference to the transcendental self. If we now assume that an exposition of the transcendental self is one clue to the phenomenological understanding of self-realization, then we may make sense of many of the manifestations of realization. The Upaniṣadic view that knowledge of *ātman* can be evoked only by designating what it is not (*neti, neti*)[9] corresponds to the fact that the transcendental self is not accessible to ordinary forms of experiencings and their linguistic equivalents. Negative statements are required not only for the description of transcendental self but for an apprehension, suggestion and appreciation of that self.

These reflections suggest that transcendental self enables the 'experience' of an empty consciousness. Consciousness is there, but the contents are gone. The particular determinations and differentiations have been eliminated in this experience. That is the realization of one's own true self. Husserl has designated it as the 'pure look', the outward gaze without objects. Such a vacuous 'look' and an empty universe is depicted in the Upaniṣads too. The subject-object duality in experiences do not have any meaning at all in this unique experience. As Yājñavalkya asks: 'Where, verily, everything has become just one's own self, then whereby and whom would one smell...[10]

The transcendence, of which Husserl speaks, is also a similar movement across from the 'natural straightforward living toward objects' to a reflective attitude in which, for a time, we do not focus on the objects of our perceptual and other intentional attitudes. Instead, we pay reflective attention to the intentions, and more exactly to ourselves in forming and having them. To quote Husserl:

> ..we are subjects for this world... experiencing it, contemplating it, valuing it, relating purposefully...it has an ontic meaning given by our experiencings...which we can realize at will. There are two attitudes; in one, the perceptive, we are...directed straightforwardly toward the object.. our gaze passes through the appearances towards what continuously appears through their continuous unification...In the reflective attitude (by contrast)...the sequence of appearances themselves is thematic, rather than what appears in them.[11]

The above elucidation suggests that realization always involves the polar duality of realization and something describable as 'object' of realization.

That is to say that in every 'act'[12] it has an object or that it possesses an intrinsic reference to an object which is other than the act itself. Being intrinsic to the act 'this objective reference' is such that no act can properly be described without specifying what object it is of. In describing an act, in our context—realization of self—two things, therefore, must at least be specified.

(1) We must state its mode, that is, whether it is a perception, or a recollection, or an anticipation or a conception and so on;
(2) Careful phenomenological disclosure of the experience of the anticipation of realization indicates that it points to something beyond ordinary human consciousness. It is experiencing as pointing to a transcendent condition, for, phenomenologically, realization is examined from within as an experience, not as an inference, nor as a hypothesis for a future life. The phenomenological analyses of realization must therefore focus on what that experience anticipates and what promises it claims to fulfil.

To understand the above structure of realization, we should examine how the need for it arises out of human condition. In the Upaniṣads, Maitreyī, Uddālaka Āruṇi, Ajatāśatru, etc. wanted to reach at some perfection which is 'immanent' in their personal egos, i.e. they wanted to reach an important otherness. The third wish of Naciketas was to acquire knowledge concerning the effect of dying. In *Kaṭha Upaniṣad*, we read thus: 'He who knows this experiencer, as the living self [ātman] near at hand, Lord of what has been and of what is to be—He does not shrink away from him.'[13] The reflection in *Katha Upaniṣad*[14] affairms the Upaniṣadic truth that man in his self-knowing is in effect seeking transcendence of his empirical self. Thus, the Upaniṣadic seer praises the immanent self by declaring that it is Brahmā, Viṣṇu, Rudra, Prajāpati, Agni, Vāyu, Indra, Moon, Food, Yamā, Earth, etc. Ultimately, this quest (of the empirical self) is a reaching out from the empirical self to an innermost reality, i.e. transcendental self. And this transcendental self is consciousness as such or consciousness of consciousness in its ultimate generality. This self is the phenomenological ground and source for the individuated consciousness. The phenomenological understanding of self-realization

as the value-ought is possible in virtue of the discovery and disclosure of this transcendental sphere. In Husserl's words:

> Consciousness in itself has a being of its own which in its absolute uniqueness of nature remains unaffected by the phenomenological disconnection. It therefore remains over as a 'phenomenological residuum', as a region of Being which is in principle unique, and can become in fact the field of a new science—the science of phenomenology.[15]

Now, let us bring to light the problem of 'specific objective reference'. To say that realization is the anticipation of the experience of 'something' is to say that realization is intentional, or to say that realization has an objective reference is the same as saying that anticipation of realization necessarily has intentionality. Intentionality, in other words, is precisely 'this universal fundamental property of consciousness, to be conscious of something'.[16] Here, we may distinguish the two poles of this situation, namely, subject in its attentiveness and the object under attention. The subject is manifest purely by its attending or intending act, while the object is always seen in one or another of possible aspects. Consequently, a phenomenological study of self-realization as the value-ought will consider the subjective pole under the aspect of the intending action, while the object will be considered according to the particular sense or meaning-aspect within which it shows itself. Thus, two correlative avenues are involved in phenomenological description of the 'act' of intending consciousness. One concerns the attending or intending action, and the other is concerned with the attended or intended sense or the meaning through which an object is attained. Husserl calls the first as the noetic analysis dealing with the subject (noesis) involved. The second he terms as noematic analysis, dealing with the noema or noematic sense involved. A word of caution is necessary here. Phenomenologically, 'object' does not mean 'thing' existing in a given universe independent of consciousness (the so-called objective world). It means rather 'ob-ject', something up against something else, namely, up against a subject. Absolutely, every meaning is an 'object' (or objectivity) in the phenomenological sense and gives a meaning for the subject.

Under this caution, the phenomenological account of intentionality may be drawn a little further to the context of self-realization. With the above caution, it may be said that the empirical self is the subject-pole of the intentional act. It means that the empirical self recognizes a field of experience in which the empirical self is the activating centre. This field is precisely my consciousness, and it is a consciousness only as mine, viz. as activated by the subject-pole, that is, the empirical self. Anything that makes its appearance does so in my consciousness, in my experiencing. So also the anticipation of realization is experienced by the empirical self in my consciousness, because a meaning is set up or formulated in my attention to it. What we mean by

the objective reference, then, is this intending of an 'object' by the empirical self.

So far I have been examining the concept of self-realization phenomenologically. It has been shown that the phenomenological analysis of the above concept is the examination of the structure of everyday experience. The analysis suggests that the value-ought of self-realization cannot be described without refering back to the human person as he is. The human person referred here is not only my 'thing body' weighing 50 kg consisting of a thalamns, hypothalmns, cortex, etc. nor nerve ganglia, nor is it the spiritual body of the mystics. It is rather the immediately experienced and experiencing lived and living body of my everyday life. To this framework belongs, I think the Husserlian remark with which I shall close: '...the Self-appearance, the Self-exhibiting, the Self-giving, of an affair, an affair complex (or state of affairs) a universality, a value, or other objectivity, in the final mode: 'itself there....'[17] We have adopted the phenomenological method in unravelling the complexity of self-realization, because phenomenology is in an excellent position for a truly meaningful value theory as it begins with the basic unity between experience and meaning.

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Quantum logic, Copenhagen interpretation and instrumentalism

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The last few years have witnessed a revival of the debate on the philosophical foundations of quantum mechanics. Recent experiments, designed to test Bell's inequality, have validated the predictions of quantum mechanics. But there are still those who hold that quantum mechanics is at best an instrument for prediction; and following the present refutation of local realist theories, Legget has initiated a programme of research whose ultimate and long-term aim is not the elevation of quantum mechanics to greater and greater heights but its overthrow, in favour of a deeper description of the world whose nature we can presently barely guess.[1]

In this paper, we shall try to investigate an attempt at resolving some foundational problems in quantum mechanics, viz. that of quantum logic. An attempt will be made to demonstrate that the rationale of the quantum logic programme was closely linked to the Copenhagen interpretation, in that quantum logic assumed the Copenhagen interpretation. This instrumental assumption in turn implied that the formalism of quantum theory was inviolate, and that some of the anomalies of the theory could be resolved by introducing many-valued logic.

1. Introduction

If the success of *QT* (Quantum Theory) as the physics of the microworld has been so phenomenal, then one pauses to wonder why so much debate on the premises of the theory continues. Discussion has centred around the conceptual foundations of *QT* as well as around the metalanguage, methodology, etc. On the one hand, *QT* has initiated a revision in the 'non-logical' content of a physical theory; on the other hand, it is claimed that a revision of the 'logical content' may also absolve the theory of certain anomalies.[2]

The difficulties underlying *QT* stem from the interpretation of probability theory and the process of quantum measurement. An instrumentalist reading of the problematic of *QT* sees the problem in the mathematical or logical formalism, and it is within this realm that the problem seeks resolution. The interpretation of quantum theory, viz. the Bohr-Heisenberg interpretation, in this scheme of things is held sacrosanct.[3] A deduction from this interpretation poses the dilemma for the formalism of *QT* as follows: *QT* is viewed as an object language, possessing statements which are semantically meaningful but empirically meaningless.[4]

Consider an atom in the left half of a box partitioned in two: once the partition separating the two halves is removed, any statement as to whether the atom is in the left half or right half of the box leaves the empricial situation undecided.[5] The problematic is thus posited in terms of the relationship between the object and metalanguages and the underlying ontology. Since the problem has now been posited in terms of the language and its ontology, there naturally arises the need to review the logic.

Before we proceed to discuss the logic of Quantum Mechanics (*LQM*), it should be noted that physicists had aligned themselves into opposing camps over the interpretation of *QT*. Einstein, Schrodinger and others reacted to the indeterminism implicit within *QT*. At the other extreme were the proponents of the Bohr-Heisenberg interpretation, later known as the Copenhagen school. As a result, the latter affected a schism within the realm of quantum theory: the delineation of the formalism of quantum theory from its interpretation has strengthened the orthodox (i.e. the Copenhagen interpretation, and instrumentalism) perspective of *QT*. *QT* then is transformed into a mere instrument for prediction with very little to explain.[6]

2. *LQM*: An Exercise in Formalism

Research into the formalism of *QT*, aimed at providing a 'complete and consistent' picture of reality, has also centred around the object and metalanguage. The most notable amongst these programmes has been that of Reichenbach, who proposed a three-valued logic commensurate with the propositions of *QT*. Simultaneously, von Neumann and Birkhoff developed a theory of lattices onto which the propositions of a physical theory can be mapped. The algebra of these orthocomplemented lattices, onto which the elementary statements of *QT* are mapped, includes the operations of set products, linear sums and orthogonal complement. These algebraic operations are homonymous with the operations of *and, or,* and *not,* of two-valued propositional calculus.[7] The three-valued logic of Reichenbach and von Neumann and Birkhoffs' construction of the *LQM* as a lattice of propositions in Hilbert space now constitute the so-called logico-algebraic approach to *QT*—an approach well within the purview of the formalism of *QT*.

A *LQM* serves two purposes:

(1) Its primary objective is to overcome ontological inconsistencies referred to earlier, and will be further elaborated in this section;
(2) In a certain sense, it is formulated as a tool for the quantum theory of measurement.

As Suppes put it: 'From the inability to make simultaneous measurements to observe joint events defined in terms of p and q, we get the most direct and straightforward argument for a non-classical logic of quantum mechanic'.[8]

However, these two objectives are not mutually exclusive. The *rasion d'etre* of the lattice theory of propositions and the three-valued logic is to be found in the Copenhagen interpretation and the underlying principle of the non-commutability of observations. A critique of either or both these programmes, wholly or in a restricted way, constitutes a critique of the interpretation of *QT*, which these programmes acknowledge.[9] This paper is not intended as an internal critique of the *LQM* ,but reviews its nexus with a certain interpretation of *QT*.

To begin with, Reichenbach's *LQM* is a three-valued logic, the third truth-value being labelled 'indeterminate (I)' to account for the possibility of not-decided; classical two-valued logic forbids this possibility.[10] The Copenhagen interpretation incorporates propositions dubbed meaningless into the framework of *QT*, e.g. the statement—an electron has position x and momentum p at time t—is empirically meaningless. This compounds difficulties for a two-valued logic, since a meaningless statement is not amenable to classical propositional calculus. To exclude this class of meaningless statements, Reichenbach introduced a third-value indeterminate. The class of propositions, assigned a truth-value indeterminate (I), is intrinsically related to the measurement theory underlying *QT*. These 'indeterminate' propositions are considered neither true nor false, but lie between truth and falsehood in a hierarchy of truth-values headed by *T*. Since the tertium has been assigned a truth-value I, the tertium non-datur is no longer a valid formula in *LQM*.[11] This is one of the divergences of *LQM* from classical two-valued logic.

It is not merely the higher valuedness of *LQM* that defines the criterion of demarcation between a classical and a non-classical logic. Developments in *QT* have not merely changed the meaning and role of concepts, but it has also enforced a revision in the operational definitions of logical connectives. Consequentially, an alternate propositional calculus for the statements of quantum theory is required.[12] The redefinition of the logical connectives of classical logic lead to *and, or,* several *not*(s), *implied*(s), *equivalence*(s) in the three-valued propositional calculus. The number of definable operations in *LQM*, therefore, exceeds the number of operations in two-valued logic.

A noteable feature of *LQM* is that it is a logic of non-commuting entities. Within *QT* a fundamental physical law of these non-commuting entities is the principle of complementarity. This principle is enmeshed as a theorem in Reichenbach's logic, and is stated as follows: *if two statements are complementary, at most one of them is meaningful; the other is meaningless.* In his own words: 'A physical law has been expressed in a logical form'.[13]

Keeping this in mind, the truth tables of *LQM* are defined, so that only statements with truth-value *T* can be asserted, statements with truth-values *F* or *I* are expressed as $\sim A$ and $\sim\sim A$ respectively. This facilitates the elimination of the statement of the truth-value of a proposition. The principle of complementarity accquires the logical representation

$$A \vee \sim A \longrightarrow \sim\sim B$$

where A and B are two propositions. If A and B have truth-value T. then we have truth-values T and F counterposed to the truth-value I. In case A and B are non-commuting entities, then this form of the law of complementarity is in the object language: A is true or false, B is indeterminate.[14]

The most salient feature of LQM is that it is a non-distributive logic. Consider the propositions, $S_x\uparrow$: the spin of the electron along the x-axis is up, $S_y\downarrow$: the spin of the electron along the y-axis is down $S_y\uparrow$: the spin of the electron along the y-axis is up. Now, $S_x\uparrow \wedge (S_y\uparrow \vee S_y\downarrow)$ reads: the spin of the electron along the x-axis is up, and the spin of the electron along the y-axis is up or down. By the identities of classical two-valued logic this is equivalent to

$$(S_x\uparrow \wedge S_y\uparrow) \vee (S_x\uparrow \wedge S_y\downarrow)$$

which reads: the spin of the electron along the x-axis is up and the spin of the electron along the y-axis is up or the spin along the x-axis is up and the spin along the y-axis is down. This is untenable, since the spin cannot be simultaneously specific along two axes. Therefore, consider a statement of the form

The energy of the electrons, i in P is e.

Now if S_1, S_2....S_R were statements concerning electrons for fixed $i=1$, 2,....R, then

$$S_1.(E=e)\ V\ S_2.(E=e)...VS_R.(E=e)$$

is false in both classical and quantum logic, though

$$(E=e).(S_1\ VS_2\ V....S_R)$$

is not false in quantum logic. Hence Putnam concludes that the only laws of classical logic that are to be abandoned are distributive laws; while de Morgan's laws, contraposition, etc. remain valid. This limitation of the distributive law, when applied to quantum measurement, is the foundational difference between two-valued logic and LQM.[15]

Von Neumann and Birkhoff, on the other hand, sought a way out of the ontological problematic by developing a theory of lattices onto which the propositions of QT could be mapped. The rationale for this approach is developed along the following lines. Corresponding to any classical system C, there is associated a phase space S such that the states of the system are in one-to-one correspondence with S. Any 'physically meaningful' statements about the system are in correspondence with subsets of S. According to this

method 'the inclusion relations for subsets naturally correspond to implication of statements.'[16] Hence there is a Boolean algebra of subsets of S representing statements about the physical system. Now, consider a system Q that does not obey the laws of classical mechanics. The totality of 'experimentally verifiable' propositions of Q, called the logic of Q, can be converted into a complementary partially ordered set by including the relations of '$\Longrightarrow$' and '$\sim$'. This is a Boolean algebra for a classical system. Quantum mechanical systems, on the other hand, constitute the logic that 'form[s] some sort of projective geometries and which are consequently non-distributive lattices.'[17] The uncertainty relations appear as consequences of the non distributive nature of the logic. Interpreting the local structure of QT *vis-à-vis a* lattice is analogous to interpreting a 'formal system by means of a particular geometry'. (p. 150).[18] Von Neumann and Birkhoff redefined the algebra of lattices, incorporating operations 'meet' and 'join' which were homonymous with the operation of set intersection and union as well as with local disjunction and conjunction.

The propositions of classical physics constitute a Boolean algebra within this lattice structure. A special non-Boolean lattice, i.e. one with a non-distributive algebra, has to be devised for the propositions of QT. This implies that a meet (b—join—c) should not correspond to the same point as (a—meet—b) join (a—meet—c). To do this a vector space and its subspace are defined onto the lattice. The union or join of these subspaces is not equivalent to set theoretic union, but is the span of two subspaces. The lattice structure associated with this altered description of 'meet' and 'join' constitutes a non-distributive lattice.[19]

In concluding this cursory treatment of LQM ,which has not covered the latest developments in the field, since we are concerned with its relationship with the Copenhagen interpretation and the instrumental nature of QT, it should be reaffirmed that these efforts are based on an interpretation that upholds 'the laws of quantum mechanics and no action at a distance'.[20] In the EPR paper, Einstein had proposed that the quantum mechanical description was incomplete and approximate. Hence there were parameters that had not been specified, and the motion of the particle was defined statistically. These statistical laws, in turn, implied 'deeper individual laws', whereby the motion of the particle is determined by a large number of hidden variables. Bohm generalizes this as follows: '...lawlessness of individual behaviour in the context of a given statistical law is, in general, consistent with the notion of more detailed individual laws applying in a broader context.'[21] Consequently, if it were possible to obtain these 'hidden variables', it would be possible to determine the trajectory. We know today that any theory of local hidden variables is no longer valid. However, the proof of Bell's inequality assumes the validity of two-valued logic (the spin of a particle is either positive or negative, a statement is either true or false). The many-valued logic introduced into QT is, as D'Espagnat holds,[22] not applicable

to the proof of Bell's inequality. D'Espagnat is more emphatic in that, given the context, it is difficult even to conceive of an alternative to two-valued logic.

But is *LQM* really an alternate logical structure, merely because it is a logic of non-commuting entities? For complex propositions involving simple propositions having truth-values *T* and *F* only, the propositional calculus of *LQM* is isomorphic with that of classical logic. It is only for those compound propositions where one or more simple propositions have the truth-value *I* that the propositional calculus of *LQM* provides different results.

LQM, then, is a logic formulated to provide answers which concur with the interpretation of *QT*. One of the classical legacies from the days of Aristotle is that 'the validity of a syllogistic demonstration does not depend on the special meaning of the terms occurring in its premises and conclusions.'[23] To take a case: that of the three kinds of negation (cyclical, diametrical and complete) in *LQM* has been defined so as to raise a metalogical statement to the level of a physical law. This definition of negation is tailored to the requirements of *QT*; in the process *LQM* is sufficiently removed from the notions (a prioricist) of logic constituting a system of universally valid axioms.[24]

3. The Difficulties with *LQM*

Having covered the distinctive features of *LQM*, aimed at resolving some of the 'causal anomalies' present in *QT*, certain marked difficulties surface. The conservation of energy in the classical language states that the sum of the potential and kinetic energies is a constant. By the principle of complementarity this statement is seen to have commuting variables (*p* and *q*). Thereby the principle of conservation of energy is indeterminate.[25] In the operator formalism, the conservation of energy asserts that the sum of various operators, not all of them commuting, will disappear.[26] But, since the operators are not diagonal, it follows that even in the language of *QT* the conservation of energy has the truth-value indeterminate. Fraasen objects to this on the ground that the laws of quantum mechanics belong to the domain of the semantics of the language, and are not part of the language.[27] But then physical theories never emerge as structured languages. It is the dichotomy between the mathematical formalism and the physical interpretation of quantum theory that has underscored the attempt to resolve the lacunae in the formalism of *QT* within the framework of the logico-algebraic approach. Attention needs to be paid to the fact that the principle of conservation of energy is empirically valid for an ensemble of particles and for individual processes. (p. 382).[28] To attribute the truth-value indeterminate to the principle of conservation of energy, whether in the classical or in the operator formalism, would be absurd.

Before it becomes pertinent to ask whether *LQM* resolves any of the 'causal anomalies' of *QT*, the question of the violation of causality within

the realm of quantum phenomena needs to be addressed. Causality seems to be violated in *QT* if it is accorded an ontological status, and is not viewed as a methodological 'regulative maxim' (p. 339).[29] It is noteworthy that the derivation of quantum laws presupposes causal relations at many levels. At what level then is causality violated? And how many quantum phenomena violating causality are explicated quantum theoretically by laws presuming the causal relations? Hubner performs a coupé by demarcating the strength of the causal principle in classical and quantum physics. Within the classical realm causality as a methodological device has unlimited applicability, its applicability, however, is restricted within the domain of *QT*.[30] The causal anomalies referred to by Reichenbach have to do with the phenomena of quantum tunneling. None of these phenomena refute the principle of contact action. What is being implied is that the causal anomalies being referred to cannot be resolved by *LQM*, since these are the problems with *QT*.

On the other hand, a plea for the consideration of *LQM* as a logic for the physics of the future is made by attributing to *LQM* a status quite analogous to that of a non-Euclidean geometry. Von Neumann demonstrates the existence of a mapping between the lattice structure of a physical theory and a projective geometry; the purport of the analogy is to devise a propositional calculus for the elementary statements of *QT*, which reflect the internal logical relationships of the theory. Putnam raises the issue of the empiricist nature of geometry: in that developments in the sciences have affected the definition of straight line and the fifth postulate of Euclidean geometry. (p. 182).[31] Given this, the scepticism displayed towards *LQM* parallels the scepticism which non-Euclidean geometries were earlier subject to: in the nineteenth century non-Euclidean geometries were largely considered 'mathematical games'. Similar opinions, Putnam suggests, are held about *LQM*.[32]

Such a parallelism, however, is not a very fair one. Non-Euclidean geometries have opened up entirely new avenues of research, and have provided physicists with insights and explanations into phenomena which were problematic. The entire field of relativitic cosmology draws its mathematical inspiration from non-Euclidean geometry.[33] Such a parallel would be apt, if *LQM* had a similar claim to make.

4. *LQM* and Instrumentalism

A minor detour is imperative, if it is to be demonstrated that a certain logical structure has been imposed upon *QT* to ratiocinate the formalism *vs* the interpretation of quantum theory schism, and *LQM* conforms to this imposition. Both logic and geometry are constituted by a set of formal statements whose validity is not dependent upon the specific meanings or values of the terms present in the statement—this would be the a prioricist argument. The truth of the theorems of geometry can be determined if there exists a correspondence theory, which relates the non-logical terms of 'empirically

identifiable elements of some subject matter'.[34] It has been pointed out elsewhere that logic as an empirical science also possesses logical relations whose truth-value is invariant with respect to the non-logical terms present in the relation.

Amongst the presuppositions which catalyzed the development of *LQM* was the presence of what were called metaphysical statements within the language of *QT*. It was hoped that an alternate logic, which was well within the interpretation of *QT*, would smoke out the metaphysical from the realm of *QT*. This neat division (that of the formalism and interpretation of *QT*) could be visualized as a bisection of a physical theory into structural components, just as logic and geometry have formal content and an empirical content.

A physical theory has an internalized logic, and the relations between the non-logical terms are written into the framework of the theory: the theory thus possesses an explanative ability, has a predictive content, and opens up new areas of research. A theory is, then, a matrix of a mathematical formalism and correspondence rules; but no theory ever 'appears in the form of a formalised language' (p. 41).[35] There are two aspects to this: on the one hand, if the instrumentalist position is accepted, then, within the framework of *QT*, *LQM* has yet to justify itself; on the other hand, if the instrumentalist position is not accepted, then there is really no argument; for the problem is, then, posited as one intrinsic to the theory and not necesarily as one with the logic.

A reductionist historiography of physics visualizes *LQM* as a more generalized version of classical two-valued logic, just as classical mechanics can be visualized as a particular case of classical theory. Such a reductionism is untenable, since it presumes that no changes of meaning have occurred in the theoretical entities constituting these theories.[36] How, then is it possible to regard *LQM* as a more generalized version of classical two-valued logic? To do so would require writing in very strong equations of constraint, and would necessarily involve the formulation of special standards, quite divorced from the demands of physical theory.[37]

5. In Retrospect

Quantum logic has been discussed for over forty years, and quantum theory coruscated into the arena of physics some sixty years ago, and has since seen considerable progress. But *LQM* has yet to find its way into the work of quantum theoreticians. Even Putnam, a spokesman for *LQM*, acknowledges that with the notable exception of Finkelstein few physicists have bothered to view or review *LQM* (p. 187).[38] The following questions arise:

(1) Has the formulation of *QT* within the framework of *LQM* allayed any of the fundamental problems of *QT*?

(2) Has the reformulation of fundamental laws of *QT* at the semantic level resolved 'causal anomalies'?

The response to these questions is not encouraging. On the contrary, one gravitates towards the thesis that an alternative perspective of *QT* is desirable. Suppes sets forth this position lucidly: '. . the history of physics reveals that it is important to trust the intuition of physicists, even if matters are not put in a polished logical or mathematical fashion.'[39] The argument put forth here leads essentially to the thesis that the programme of *LQM* commences amidst a certain orthodoxy within the community of quantum theoreticians, which posits the way out of the impasses of *QT* by manipulating the formalism and then generalizing it. This orthodoxy articulated itself within the tradition of the Bohr-Heisenberg interpretation. A plausible corollary of this interpretation is that *QT* provides a complete description of reality; and that the task left over is to come to terms with the mathematical formalism and learn to apply it.[40] This corollary accquires the proportions of a ukase rather than serve as a metaphysical maxim defining the limits of epistemological validity. Einstein has labelled this pseudo-epistemological injunction 'die endgultige physik and refused to take it seriously.[41] There have been innumerable critiques of the Bohr-Heisenberg interpretation both from within and without the Copenhagen school. What remains indubitable is that the 'end of the road' hypothesis entails that all future theories of physics must have duality written into them.[42] Whether *LQM* comes to stay as the logic for the physics of the future or not, debate has centred around some important presuppositions of physical theories. But this has to be asserted with caution, for the positivist fetish for smoking out the metaphysical from the realm of physics has almost rendered philosophy irrelevant to science.[43] Once the philosophical foundations are no longer considered germane to the development of physical theory, the dilemma of meaning appears. The ontological problematic of the physical theory is subsequently framed in terms of an inadequately or insufficiently internalized formalism and an impregnable interpretation. With the relegation of ontological and epistemological issues to the philosophical background instrumentalism creates an ever-widening hiatus between the interpretation and formalism of *QT*.

There exists an informal understanding amongst physicists that an alternate perspective is desirable, despite the successes of *QT*. The peculiarities of *QT* remain in spite of the brave efforts of the logico-algebraic approach.[44] These difficulties persist; and it would be absurd to qualify reality as bizzare,[45] or by setting definite epistemological boundaries to what is cognizable.

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36. For example, Hubner, *op. cit.*, p. 31, points out the chance in the notion of space, whereas Newtonian space is Euclidean and within which gravitational forces are operative, the Einsteinian space is curved and without gravitation.
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Prediction and explanation in economics

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It is interesting to note how two eminent economists differ regarding their emphasis on prediction and explanation in economics. Friedman in his essay, 'Methodology of Positive Economics' (1953), stresses economics as concerned with prediction, while Hicks in his book, *Causality in Economics* (1979) discusses the explanatory significance of causality. Is not economics, as all other sciences are, concerned with both explanation and prediction? Is economics basically different from the natural sciences and, therefore, has a methodology peculiarly its own? Is causality in economics, for example, not what it is in the natural sciences? Is economics a positive science as other natural sciences are? While Friedman calls economics a positive science, Hicks calls it a discipline, not a science; and Rosenberg says it is not science at all, but is just mathematics (Rosenberg's article, 'If Economics Isn't Science, What Is It?' 1983.

I shall briefly discuss Friedman's thesis before I take up Hicks and then Rosenberg. The following points state the main thesis of Friedman:

(1) 'Positive economics is in principle independent of any particular ethical position or normative judgements.... Its task is to provide a system of generalizations that can be used to make correct predictions about the consequences of any change in circumstances. Its performance is to be judged by the precision, scope, and conformity with experience of the predictions it yields. In short, positive economics is, or can be, an 'objective' science, in precisely the same sense as any of the physical sciences' (1953, p. 4).

(2) 'The ultimate goal of a positive science is the development of a 'theory' or 'hypothesis' that yields valid and meaningful (i.e. not truistic) predictions about phenomena not yet observed. There are two parts in 'theory' or'hypothesis'. One is language, which is partly logical, partly factual, and is a filing system for organizing empirical material. 'Factual evidence alone can show whether the categories of the analytical filing system have a meaningful empirical counterpart. . that is whether they are useful in analysing a particular class of concrete problem' (1953, p. 7). 'Supply' and 'demand' are such categories.

Secondly, viewed as a body of substantive hypothesis, theory is to be judged by its predictive power for the class of phenomena which it is intended to 'explain'.

> 'The only relevant test of the validity of a hypothesis is comparison of its predictions with experience...Factual evidence can never 'prove' a hypothesis; it can only fail to disprove it, which is what we generally mean when

we say, somewhat inexactly, that the hypothesis has been 'confirmed' by experience' (1953, pp. 8-9).

Between alternative hypotheses 'simplicity' and 'fruitfulness' are suggested by Friedman as criteria for selection.

(3) Hypotheses have not only 'implications' but also assumptions. Assumptions have a role in determining the validity of a hypothesis. Can a hypothesis be tested by the realism of its assumptions? For Friedman 'the relevant question to ask about 'assumptions' of a theory is not whether they are descriptively 'realistic', for they never are, but whether they are sufficiently good approximations for the purpose on hand' (1953, p. 15). The development of the analysis of monopolistic and imperfect competition took place, because it was felt that the assumptions of perfect competition and perfect monopoly gave 'a false image of reality'. This belief itself was the result of directly perceived descriptive inaccuracy rather than due to derivations of contradictory predictions from neo-classical economic theory.

The several inconsistencies in Friedman's position are pointed out by Helm in an article in the *Oxford Economic Papers,* (New Series, Vol. 36, November, 1984). Friedman seems to be a positivist when he emphasizes observation over theory; regards prediction rather than explanation as the goal of science; stresses verification and falsification; and professes belief in the unity of science. Some consider Friedman to be an instrumentalist rather than a positivist, as he claims that theories and assumptions are only instrumental to the production of predictions. But instrumentalists say that theories are neither true nor false, whereas for Friedman there is a relationship between logical statements and observable reality involving their truth and falsity. Whether one considers Friedman to be an instrumentalist or not, he is an empiricist, committed to predictive science.

Now we turn to Hicks. Hicks objects to empiricist methods in economics. First of all, he is struck by the essential differences between economics and natural sciences. Economic theories, he says, are time-dependent. Economic institutions and behaviour alter with the passage of time, and the more characteristic problems are not static ones are, but 'problems of change, of growth and retrogression, and of fluctuation' (1953, p. xi). Scientific methods are less applicable to economics as in economics everything is dated. 'Because the economist is concerned with current affairs, he has particular responsibility with respect to time.' Hicks is concerned to show that economics is like history. He says:

> What the past is to the historian, the present is to the economist. The work of each of them is in time, in historical time, as the work of most natural science is not. Experimental science, in its nature, is out of historical time; it has to be irrelevant, for the significance of an experiment, at what date it is made, or repeated (1979, p. 3).

Hicks, of course, mentions astronomy and geology as having 'their own calendars'.

Since 'the present is fleeting', economics is concerned with 'recent past' and 'near future'. 'There is an overlap between the work of the economist and the work of the historian. For there is no logical difference between the study of recent history and the study of the history of earlier periods' (1979, pp. 3-4).

Hicks adds:

> ...the economist is concerned with the future as well as the past....It is the past that provides him with facts, the facts which he uses to make his generalizations; he then uses these generalizations as bases for prediction and for advice in 'planning'. In purely historical work, the latter element is missing or is at least less prominent (1979, p. 4).

Economics is 'on the edge of sciences and on the edge of history' (1979, p. 4) as all other social sciences also are. But, unlike other social sciences, it is 'specially concerned with the making of decisions, and with the consequences that follow from the decisions' (1979, p. 5). Hicks then goes on to discuss causality as 'the search for "laws" or generalizations, on the basis of which we can assert something about the causes of events.' Old causality held cause as connected with some action, human or supernatural. Since economics is concerned with human actions and decisions, there is 'a way in which it comes nearer to the old causality than the natural sciences now do' (1979, p. 9).

Whereas Friedman not merely considers economics to be a positive science like the natural sciences, and models economics on physics and discusses problems connected with theory, empirical evidence, assumptions, predictions, etc., taking examples from physics, Hicks is at pains to distinguish economics from the natural sciences and call it an 'imperfect science', even only a discipline and not science. Hicks also maintains that economics can at best make weak predictions. These weak predictions are claims about what will happen if other things remain the same. Since ceteris is almost never paribus, a particular set of observations can never, themselves, form the basis for testing a hypothesis.

It is necessary to note Hick's analysis of causality in his book *Causality in Economics* (1979) and in his article 'The New Causality: An Explanation (*Oxford Economic Papers,* New Series, Vol. 36, March 1984) as it is the cornerstone of his anti-positivistic methodology. There are three parts in his analysis of causality: (*a*) the distinction between strong and weak causality; (*b*) the analysis of counterfactuals; (*c*) temporal ordering and three kinds of causal connections—sequential, contemporaneous and static.

A and *B* are events in the causal connection. They occur in time, not necessarily moments of time, but may be periods, even quite long periods. For example, the unusual lack of balance between sexes in the population of Britain in 1930's was caused by World War I. From this example it is evident that one cause may have many effects, and that one effect may have many

causes: *A* caused *B* is ambiguous. It may mean that *A* was one of causes (weak causation) or *A* was the sole cause of *B* (strong causation). A number of causes make a vector say (a_1, a_2,...*an*) producing the total effect *B*. Each component of the vector is a weak cause of *B*. Only if the vector is a one-component vector or if the background conditions remain unaltered can we say that strong causation exists. The relationship between the components may be either separable or non-separable, and there is a priori reason in economics to suppose the former necessarily holds in any particular case. So long as it is multi-membered, prediction is also weak, since it depends on nothing happening to the other components.

The second part of Hicks' analysis of causality is regarding counterfactuals. It is important that we recognize that *A* and *B* are events, and that both did actually occur.

> For causality, we must be maintaining that if *A* had not existed, *B* would not have existed; if not *A*, then not-B. But not-A and not *B* are not events which have happened; they are events which have not happened (1979, p. 8).

These counterfactuals, according to Hicks, are 'theoretical constructions'. He maintains that 'we cannot say anything about them unless we have some theory of the way things are connected' (1979, p. 8).

The third part of Hicks' analysis of causality is to supplement traditional sequential causality by two other possibilities—static and contemporaneous. Sequential is one in which cause precedes effect; contemporaneous is one in which both relate to the same time period, e.g., flow magnitudes, what is produced or consumed or paid over during such a period, say, an year, and static in which both are permanencies. The relation between such magnitudes may be reciprocal, but we often treat one as exogenous, others as consequences, the one, therefore, as cause, the others as effects.

Hicks also points out:

> ...any statement of causality of whatever kind, has reference to a theory; it is because we regard the events, which we state to be causally related, as instances of a theory, that we can make the statement of relation between them (1979, p. 26).

I now state in Hicks' own words as far as possible what he has to say about causality, theory and certain basic connected issues. Causality, of whatever kind, Hicks says, is always a relation, a relation between facts. Yet, it appears to be a theoretical relation between facts. Look at the statement: if not-*A*, then not-*B*. Not-*A* and not-*B* must include relevant alternatives to *A* and to *B*, not just any conceivable thing other than *A* and *B*. *A* has a characteristic *a*, *B* has a characteristic *b*, which the alternatives do not have. Theory has to give us a

rule of implication. Not-*a* implies not-*b*. Can one characteristic imply another? Implication is a relation between propositions. If a theory is to be applied to facts, there cannot be a mere deduction of propositions. It is necessary to have some proposition which is inductive in character. The relation between characteristics is empirical. But the statement about their association is a proposition. It can have implications, and these implications can be tested empirically. Inductions are not mere collections of facts without some ordering principle. A statement that two characteristics are commonly found together, is the simplest form of induction. To do this a class of phenomena should already have been distinguished, and this is the work of classification. Classification is primary work, and, when first done, science is still in the future. Classifications may be unscientific initially, and done by those, who are not scientists, examples are astrologer's work in relation to astronomy, alchemists and chemistry, quacks and medical science. In economics, Hicks recognizes the work of administrators and accountants concerned about practical problems of calculating imports and exports or profit and income. These were men first concerned about the search for concepts which will facilitate description of economic facts. Hicks takes Adam Smith's study as an example of application of theory. In understanding the phenomenon of division of labour and specialization as a major source of improvement in productivity and how it is limited by the extent of the market, Smith uses the theoretical principle that people act economically. Hicks analyses Smith's study to illustrate the place of theory in understanding facts causally related.

At this point, it is worth taking up Addison *et al.*s' analysis of causality, which is done with special reference to the concept in social sciences (*Oxford Economic Papers,* New Series, Vol. 36, March 1984). Referring to Hicks' distinction between Old and New Causality, Addison *et al* point out that new causality is generally analysed today in terms of the notions of necessity and sufficiency. First of all, they question whether the notions of necessity and sufficiency can be employed 'with complete philosophical propriety when the field of enquiry consists of human and societal phenomena rather than purely physical phenomenon'. Secondly, they make a distinction between causation of a particular single phenomenon and causation of any particular instances of a given kind of event, between singular causation and general causation. Failure to distinguish between the two 'muddies an investigation as to the 'cause' of something'. They take the example of inflation. The cost-push analyst's explanation of British wage explosion in the late 60's is concerned with causation of singular event, whereas Friedman declaring that 'inflation is always and everywhere a monetary phenomenon' is obviously referring to the general phenomenon. In economics as in other social sciences, we are concerned with both singular and general causation, whereas in natural sciences its is commonly general causation which is of interest (except in astronomy and geology), and we are not concerned with particular singular cases, e.g., the

particular frog dissected or a particular experiment in chemistry. As Hicks has pointed out, natural sciences are not concerned about time.

Addison *et al* discuss plurality of causes as possible in connection with the causation of general events. It is an empirical fact, they maintain, that different instances of the same kind of event may be brought about by sufficient sets of factors which contain different sorts of members. Factors a_1, b_1, c_1, d_1, (i.e. instances of factors of kind *A B C D*) are sufficient cause of p_1 (an instance of phenomena of kind *p*). a_1, e_1, f_1, g_1 and h_1, i_1, j_1, k_1 are sufficient for p_2 and p_3. The question is how far is this notion of 'plurality of causes' tenable? If, for example, causes of war constitute the problem of general causation, is not plurality applicable only because singular events are taken as 'particular instances of some one kind of event'?

An interesting point which Addison *et al* make in their article is the importance of J.L. Mackie's INUS condition of causality 'Causes and Conditions', 1965. According to Helm (1984), Hicks too seems to refer to it in his definition of counterfactuals. To quote Mackie:

> When we take *A* to be...a partial cause of *B*, we can say that, if *A* had not occurred, *B* would not; a cause is to be taken in this counterfactual sense necessary in the circumstances for *B*, though sometimes also sufficient in the circumstances as well, or perhaps only sufficient in the circumstances and not necessary: we have alternative counterfactual concepts of causation (*The Cement of the Universe*, 1975).

Addison *et al.* believe that the INUS condition 'an insufficient but necessary part of a condition which is itself unnecessary but sufficient for that result' has not sufficiently filtered into the general usage in economics and other social sciences. They give an example about role of investment and economic growth. Investment is not a sufficient condition for growth. Investment of capital in wasteful projects does not promote growth; it is rather a squandering of resources, not their more efficient use. Equally, physical capital accumulation is not a necessary condition of economic growth, since growth can occur in its absence. Therefore, investment is neither a necessary nor a sufficient condition for growth. Is it, therefore, not a cause of growth? It clarifies matters to perceive investment as an INUS condition for economic growth. It is insufficient on its own, but could be a necessary element of a set of conditions (including a social co-ordinating mechanism that promotes the allocation of capital resources to their most productive uses) which, while being unnecessary, appears to be sufficient (according to available evidence) to bring about economic growth.

Another problem, which is very important both in natural and social sciences, is that of selecting only those factors which are causally relevant. As Hicks maintains, it is necessary to have a hypothesis or theory to help isolate relevant factors. It is necessary that the factors are small in numbers and

isolable from the universe-at-large. The difficulties, incidental to economics and the other social sciences as compared with physical sciences, are well known. In fact, Hayek (*Studies in Philosophy, Politics and Economics*, 1967) discusses how complex social phenomena are, compared to the physical. Also, on epistemological grounds, he says that what we know in the social sphere is markedly inferior in precision than what we know in physical sciences.

Addison *et al.* are also concerned about how causality operates in the sphere of human action. They say that human behaviour is telic, goal directed. Human beings endow objects with meaning, significance. Anything bestowed with significance, e.g., a coin, becomes a causal factor. Purposiveness, consciousness cannot be reduced to the purely physical. Addison *et al* maintain:

> While the physical and social setting may well be the largest single factor shaping human conduct and interaction, creativity, novel thought and genuinely deliberative action are also found.... We argue that it is a basic mistake even to regard the failure of the social sciences including economics to measure up to the quantitative exactness and explanatory and predictive precision of physics as a problem. Our claim, at the root, is simply that in the social sciences we are dealing with phenomena that belong to a different category of existence from that of the phenomena studied in the physical sciences (1984).

What is referred to by Addison *et al* as telic behaviour and deliberative action is elaborated by Helm in his article 'Prediction and Causes' (1984). Helm maintains that 'to explain an action involves positing causes. Human actions, unlike scientific observations, are partially or weakly caused by the reasons that the person has in carrying out the act.' Helm relies on Davidson's famous article 'Reasons as Causes' (1963), and accepts how only certain types of reasons can act as causes. Davidson calls them primary reasons and defines the term as follows:

> *R* is a primary reason why an agent performed the action *A* under the description *d* only if *R* consists of a pro-attitude of the agent towards actions with a certain property, and a belief of the agent that *A*, under the description d, has that property.

The inclusion of primary reasons as causal factors in explanation leaves the substantive problem of how these might be in practice identified. Nevertheless, it is increasingly felt by social scientists that reasons cannot be ignored in the explanation of human action.

Though this aspect of explanatory causality is not discussed by Hicks, his acceptance of economics coming nearer to old causality sharply distinguishes his point of view from that of Friedman. However, in fairness to Friedman, one must admit that, in his more practical work, Friedman is not strict about

his positive methodology, and even develops theoretical constructs without immediate empirical counterparts.

I would like to conclude by examining a few points made by Rosenberg in his article, 'If Economics Isn't Science, What Is It?'. I am relying largely on Hands' discussion of this article (*Philosophy of Science*, Vol. 51, 1984). Rosenberg maintains that economics is simply not science at all because of its 'predictive weakness' and its inability to 'improve its predictive content'. Hands disagrees with Rosenberg, and, though he admits that it is 'nowhere near the standards of the best natural science', he maintains that modern macro-econometric models provide extraordinary accuracy relative to pre-World War II business cycle models. Again, contrary to Rosenberg's claim, Hands says that predictive success is an important criterion of theory choice in economics. One of the reasons for this is that economic predictions are consumed by the business community. In fact, these business interests are not concerned about the underlying theories but only with predictive accuracy. Of course, only a strict instrumentalist would claim scientific legitmacy for a theory exclusively in terms of predictive success. Hands admits that the general equilibrium theory (in its standard Arrow-Debreu formulation) is neither explanatory nor predictive in a way that satisfies a discerning philosopher of science. But most economists find its merit in something outside the traditional criteria. For example, Hausman, in his paper 'Are General Equilibrium Theories Explanatory?' (1981), looks to its 'heuristic value' and 'theoretical reassurance' rather than its ability to provide explanations, that it 'helped in developing empirical theories'. Rosenberg calls economics not science at all but just mathematics mainly because of the 'formal rigour and sophistication' of the general equilibrium theory. Hands admits that this 'elegance' is neither necessary nor sufficient for sciences, but emphasizes how this formalization has contributed to an evolution of economic thought different from the development of the social sciences. He says that the theory has pragmatic merit, and, perhaps considering the complexity of the social world, pragmatic criteria may be the only criteria for theory choice.

I would now like to see whether the 'pragmatic criteria', referred to by Hands is not at the core of the MSRP (Methodology of scientific research programmes), which has been developed by Lakatos and applied to economics by Latsis (1976). In MSRP, instead of appraising isolated hypothesis or systems of hypotheses, the whole research programme is considered as one organic unity and appraised. Auxilary hypothesis may get modified or replaced by falsification. But the positive heuristic the hard core is not given up without giving up the programme itself.

Blaug (1976), however, does not think that MSRP fits the history of economics. Quoting Samuelson's *Foundations*, he says: '...there has never been absent from the main body of economics literature the feeling that in some sense perfect competition represented an optimal situation.' This explains the sway of concepts such as competitive equilibrium and justification of market

mechanisms over research in economics. What Blaug expects is that economists may cling to 'degenerating' research programmes, because they are suspicious of data and accustomed to certain basic concepts.

In conclusion, what seems to be important to the working economist is that the explanation of phenomena he proposes is satisfactory, because the predictions he makes on that basis are applicable to the real world.

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Scientific method and the study of society*

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1. Introduction

Two basic questions seem to have attracted detailed and extended attention in the literature concerned with the methodological aspects of the social sciences. These are:

(*i*) Is the scientific method as formulated and practised (so successfully) by the physical scientists directly applicable to the social sciences? and
(*ii*) What is the relevance of psychology (the science of individual behaviour) to the explanation of social phenomena; more specifically, is psychology the foundation for the social sciences.

In analysing the scope and relevance of the scientific method to the study of society in this paper, I shall develop my arguments by focusing on these two questions.

Notice, to begin with, that before the first question can be answered we must agree on what constitutes *the* scientific method as practised by the physical scientists. And analogously a prerequisite to answering the second question is an agreement, on the one hand, on the kinds of phenomena psychologists (must) concern themselves with and the kinds of questions they [must] try to answer; and, on the other hand, on the kinds of phenomena sociologists [must] concern themselves with and the kinds of questions they [must] try to answer.

The received view of the method of the physical science is, of course, that the physical scientists study natural phenomena, i.e. physical objects and events, and they do this by constructing theories of such phenomena which are formulated in the form of generalized laws. Using these laws physical scientists are able to predict the properties of physical objects or occurrences of physical events with acceptable accuracy. Social scientists, i.e. psychologists and sociologists, who believe that the method of the physical sciences is equally applicable to their own domains of study have been trying hard to formulate behavioural laws and social laws in the hope of being able to predict individual behaviour and the behaviour of social systems respectively.

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One cannot say that the social scientists, so far, have been very successful in formulating such general laws applicable either to individual behaviour or social behaviour. Should their inability to formulate such generalized laws with convincing predictive power, then, be automatically considered to be an indication of the 'non-scientific' nature of the social science disciplines?

Not all social scientists, of course, accept the view that the method of the physical sciences is directly applicable to psychological or sociological phenomena. Several arguments are usually advanced in support of an 'anti-naturalistic' position:

(*a*) Unlike the physical sciences which operate on the assumption that natural phenomena are uniform throughout space and time, individual and social behaviour possess no such uniformities. Hence the social sciences cannot expect to formulate generalized laws to predict such behaviour.

(*b*) The experimental method of the physical sciences, which is based on artificial isolation and control of the system being studied, is inapplicable to social and psychological systems, since with these systems such isolation and control would destroy the very properties one is attempting to study. Moreover, repeatability of experiments in the social sciences is, in principle, infeasible, since identical boundary conditions cannot be repeatedly established.

(*c*) What are of central importance in the study of individual and social behaviour are concepts like 'value' and 'meaning' or 'purpose'. These are precisely the concepts that the physical sciences avoid. Predictions based on causal explanations which typify the activities of the physical scientists are hence of little relevance to the social scientists in so far as they do not come to grips with 'value' and 'purpose'. The important requirement in the social sciences is to be able to *describe and understand* individual and social behaviour and not necessarily to be able to *predict* such behaviour.

(See Popper [1957] for more detailed accounts of both the 'naturalistic' and 'anti-naturalistic' positions in the social sciences).

These 'anti-naturalistic' arguments sound plausible enough from the point of view of a layman. And together with the received view of the physical sciences they would seem to make it impossible for the physical and social sciences to function on the basis of a uniform methodology. Again, this would lead to the conclusion that the social sciences are not 'scientific' in the sense in which the physical sciences are.

The 'naturalistic' as well as the 'anti-naturalistic' views, thus, seem to lead to similar conclusions. But how valid is the received view of the method of the physical sciences which is taken for granted in both these views? Is prediction the central aspect of scientific activity even in the physical sciences? If not, what is the role of prediction in theory construction in the physical sciences? 'Value' and 'purpose' play no role in the physical sciences. Then, how/why do they acquire central importance in the study of individual and social behaviour? What is an appropriate scientific framework for the study of behaviour taking into account 'value' and 'purpose'? What would be the

nature of theories of behaviour constructed within this framework? How would such theories be tested? Would prediction have any role to play in this theory construction activity?

2. The Method of the Physical Sciences

If someone were to ask, 'What is science about?' most practising physical scientists are likely to answer that in our normal interactions with the external world we observe certain uniformities, regularities, or patterns. These regularities and patterns are a consequence of the fact that natural phenomena are governed by laws. It is the purpose of science to determine these laws and to systematize the relationships between them. The scientific method consists of performing experiments, making carefully controlled observations, and constructing theories to explain the experimental results so obtained. In this way, scientists arrive at laws that govern natural phenomena. This, as we saw earlier, is very much the received view of science and of the scientific method.

However, if we try to probe in greater technical detail the epistemological roles experiments and theories play in scientific activity, we shall find that theories, far from being applicable to natural phenomena, relate only to controlled observations, i.e. only to experimental situations. Performing experiments (or making systematic observations of controlled situations) forms the basis of all scientific activity. To begin with, experiments enable the delimiting of phenomenological relationships to account for which theories are invoked or constructed (if unavailable initially). The statements or consequences derived from theory are verified by (tested by) experiments. The predictions of a theory are predictions of occurrences of events in experimental situations, i.e. observations made under controlled conditions. So, if one wants to know what scientific theories are theories of, the answer is they are theories of experiments; or, more precisely, they relate to properties and relationships determinable in experimental situations.

Uniformities and regularities relate only to controlled situations. Regularities exist in the open-ended world only to the extent to which the contextual parameters determining the natural phenomena under observation remain more or less constant. Science can hardly ever predict what happens in the open-ended world. Meteorological predictions are usually so unsatisfactory, precisely because the meteorologist, unlike the atomic physicist, can exert very little control over the situational aspects he is dealing with. It may seem that astronomical predictions contradict these assertions. But on closer analysis, we shall see that it is not so. As Jevons in 1958 and, more recently, Popper in 1957 have emphasized, the solar system, fortunately for us, is a naturally isolated and closed system (for all predictive purposes) approximating very much an experimental set-up. Taking advantage of this

> Astronomers... select precise times and places for important observations of stellar parallax, or transit of planets. They make the earth's orbit the basis of a well-arranged *natural experiment*, as it were, and take well-considered advantage of the motions which they cannot control (see Jevons [1958]).

If scientific theories relate to properties and relationships of phenomena observed only in experimental situations, then how does science relate to naively observed natural phenomena? How do we *explain* such phenomena in terms of scientific theories? The answer is that a theory is applicable to a naively observed situation to the extent to which this situation approximates the relevant experimental situation. If the approximation is good, predictions based on theory are verified; otherwise, not.

From the above account of what science is really about we can draw two conclusions. Firstly, it is a false view of science to argue that a theory is not 'scientific' unless it enables the prediction of naturally observable phenomena. Theories in the physical sciences also do not allow us to predict in this sense. As we have just now seen, theories are applicable to naturally observable phenomena only through much indirection. Prediction is of value in theory construction only to the extent it enables the *testing* of theories through performing controlled experiments. The second conclusion is this: the notion 'experiment' is *the* central notion in the methodology of the physical sciences. Performing experiments is *the* central aspect of scientific activity in the physical sciences.

So, if we want to find out whether the methodology of the physical sciences is directly applicable to the social sciences, we must first analyse and understand in greater detail what performing an experiment consists of. As we shall see presently, such an analysis would show that the availability of *agents* is a prerequisite to performing experiments. Although the physical sciences, in this sense, take for granted the availability of agents to perform experiments, they do not concern themselves with phenomena of which agents form an integral part, i.e. experimental situations of which agents form constituent parts. It is precisely in this way that the basic difference between the physical and the social sciences arises; for the social sciences *are* concerned only with phenomena of which agents form an integral part. And we shall see that the inclusion of agents in a situation gives rise to categorically new phenomenological aspects. In trying to account for these aspects, social sciences are required to concern themselves with new categories of explanations.

In addition, we shall see that performing experiments involving agents is often difficult or even infeasible. Because of this 'prediction' cannot be used as a method to test theories in the social sciences. Most of the time one must have recourse to indirect means for testing theories in these disciplines. What such indirect means could be and how to construct such indirect procedures (which are at once objective and viable) are, in fact, the central issues

that need to be tackled before acceptable scientific methodologies for social sciences could be evolved. We shall discuss these issues in greater detail in the sections that follow. (For more detailed discussions about the nature of scientific activity and the differences between the physical and the behavioural sciences as regards their objectives and methodologies, see Narasimhan [1973]).

3. The Role of Agents in Performing Experiments

A scientific experiment is a controlled interaction with a prepared environment. Specifying an experiment requires the specification of four components:

(*i*) Specification of the initial and boundary conditions of a delimited environment, i.e. the preparation of the experimental set-up;
(*ii*) specification of the interaction procedure, i.e. the manipulatory part of the experiment;
(*iii*) specification of the observations to be made i.e., the data acquisition part of the experiment; and
(*iv*) specification of the computations to be performed on the observations, i.e. the data analysis part of the experiment.

It is important to note that carrying out an experiment on the basis of such specifications presupposes the availability of (*a*) a *language* in which these specifications can be given; and (*b*) an *agent* (observer, experimenter) who can interpret the specifications and carry out the experiment, i.e. manipulate, observe and analyse.

When an experiment has been specified in an exact manner (so that the specifications relating to the experimental preconditions and the manipulations can be mechanically interpreted and verified), we can construct an automaton to interpret the statements specifying an experiment and carry out the intended tasks. The possibility of automating laboratory experiments arises precisely in this way.

The agentive aspect of an agent (in this context) is characterized by the possession of a *repertoire of actions* using which the agent is able to explore, monitor and manipulate the environment in various ways. For purposes of carrying out a scientific experiment, the agent concerned should also be able to understand the language in which the specifications of the experiments are given. But this is a very special requirement. In general, the agentive aspect is characterized by the possession of an action repertoire, and by the ability to use these actions to interact with the environment in various ways to achieve intended end results. *In this sense, all biological organisms are agents.*

The fundamental difference between the physical and the behavioural sciences, then, is that (I am using 'behavioural sciences' as a more inclusive

term than 'social sciences') the behavioural sciences are concerned with the explication of phenomena of which the agentive aspects of agents form an essential part. The situations that the physical sciences study do not involve agentive aspects in any sense. The distinction between the physical and behavioural sciences arises not because of somep resumed difference bet ween the physical and the 'mental'; but precisely because of the difference in the characterization of phenomena that do not involve any agentive aspects and those which do involve them. It is just this distinction which leads to categorical differences between the kinds of explanations physical sciences concern themselves with and those which the behavioural sciences have to come to grips with (as we shall see presently).

Although all biological organisms are agents, the only language-using agents seem to be human beings. And interpersonal interaction, i.e. socialization, would seem to be an essential precondition for language acquisition by children. The phenomena relating to agents, then, can be broadly divided into four classes according as the agentive behaviour included in these phenomena involves language usage or not, and socialization or not. These four classes can be exhibited in the form of a matrix identifying the broad specializations in the behavioural sciences they give rise to.

Language usage \ Socialization	No	Yes
No	Experimental Animal Psychology	Ethology
Yes	Experimental Psychology of Individual Behaviour	(i) Social Psychology (ii) Sociology

4. Explanations Relating to Agentive Behaviour

In considering the types of explanations that arise in the behavioural sciences, I shall restrict my considerations, to begin with, to the behaviour of individual organisms. We shall discuss explanations relating to behaviour dependent in an essential way on sociological factors a little later.

In dealing with the agentive aspects of individual agents three types of explanations arise. Firstly, we have explanations that are concerned with the explication of the nature of any given action belonging to the action repertoire of an agent. A satisfactory explanation would try to account for a given action in terms of a set of subactions suitably related and sequenced. Explications of actions could only be done in terms of information-processing systems. Actions manipulate the external environment, and hence call for the sensing and analysing of the state of this envirnoment; and require the deployment of appropriate control actions to arrive at the desired state of affairs. Information-processing systems with the appropriate sensors and effectors are designed precisely to accomplish such tasks. Let us call explanations of this class Type I Explanations.

The second type of explanations—call these Type II Explanations—would then be concerned with the physiological realizability of such information-processing systems. Such explanations would concern themselves with the kinds of physiological building blocks used in an organism and their interconnections as well as with the properties of these building blocks. This is the class of explanations given at the level of anatomy and physiology or biology.

A third class of explanations—Type III Explanations—arise when one seeks to account for particular occurrences of actions or states of agents. Explanations of this class would require the postulating of a set of laws of behaviour and appropriate antecedent conditions, which could together be verified to result in the observed behaviour or the state of the agent. Concerning this class of explanations two points should be noted. Firstly, in so far as a specific behaviour of an individual occurs in a social context, sociological considerations may have to be invoked even to explain individual behaviour. We shall discuss this link between sociology and psychology in more detail later. Secondly, predictions based on Type III explanations apply to, and can strictly be verified only in, experimental situations, as we saw in Section 2 earlier. They could be related to real-life situations only through much indirection.

Notice, first, that Type I and Type II explanations do not arise in the situations that the physical sciences study which relate exclusively to objects. The physical sciences are, hence, concerned only with Type III explanations, that is, with the 'causal' explanation of particular properties or states of objects, or of specific spatio-temporal events involving objects. Since all such explanations are based on the postulation of physical laws of various kinds, one gets the impression that scientific activity consists pre-eminently of the 'discovery' of physical laws 'which Nature obeys'. We have already seen why this is a false view of science.

Secondly, it is clear that explanations of the first two types logically precede those of the third type as far as agentive behaviour is concerned. To answer 'why did that action occur now?' and 'why is the agent in this state?' one would have to know the nature of the action and the details of its realization to begin with, or the characteristics of the behavioural system to which the particular state relates.

Actually, however, much of academic psychology has been preoccupied with Type III explanations. The all-too-obvious success of physical scientists

in predicting and controlling physical situations have led most psychologists to assume unquestioningly that prediction and control are the essence of scientific activity. And they have been almost exclusively concerning themselves with the formulation of general 'laws' of behaviour to enable them to predict and control the behaviour of organisms. But we have already seen that prediction, even in the physical sciences, plays a central role only in the restricted context of rigidly controlled experimental situations. It may very well turn out that significant aspects of behaviour of most organisms cannot be realized under rigid experimental conditions. Also, socially acceptable boundary conditions may be incompatible with the kinds of experimental situation a science of behaviour may demand for controlling behaviour. Thus, experiments carried out, and results obtained, on predicting and controlling behaviour within the confines of a laboratory may well turn out to have little relevance to behaviour in the open-ended situations of real life.

Even assuming that the practical value of a science of organismic behaviour consists, ultimately, of our ability to create the necessary boundary conditions to shape behaviour in acceptable ways, it is evident that this task cannot be coped with before articulating Type I and Type II explanations. But major methodological problems arise when we attempt to do this, as we shall discuss now.

5. Need for a New Experimental Framework to Study Organismic Behaviour

In trying to articulate the agentive aspects of an organism from an information-processing viewpoint (i.e. in generating Type I explanations), let us note, first, the following three distinguishing characteristics of an agent:

(1) An agent has a repertoire of *actions* which it can deploy for intentionally interacting with the world;
(2) An agent has a set of *sensory interfaces* through which information concerning the state of the external world and, in particular, concerning the changes caused in the external world by its own action is available to it;
(3) An agent has a set of *motivational states* which condition the intentions or goals of the action the agent engages in or embarks on.

The externally observable behaviour of an agent consists of the complex of actions it engages in. At the most primitive level, an agent engages in an action to bring about a desired-for-change in the state of the world (external or internal). The desired-for-change is the *goal* (objective, aim, purpose, intent) of the action. (Notice that the role of an agent in performing an experiment calls for the ability to engage in goal-directed actions of this sort). Goals, in general, may require the execution of a complex *program* of actions:

(*Program* is used in the information-processing sense. A reflex would thus be a pre-wired program). Habits are already-built-up programs that get executed more or less autonomously. In other cases, achieving a goal may require the deliberate formulation of a *plan* of actions. That is, a program to achieve a goal may not be available ready made, but may have to be built up either on the basis of theoretical considerations or through exploratory experiments. In either case, an agent must have available to it *knowledge* or a *knowledge base* to construct a plan of actions. (It is perhaps more appropriate to talk in terms of *beliefs* and *belief structures* in this context rather than *knowledge* and *knowledge base*. Validated beliefs may be called 'knowledge' following the usual practice). Execution of a plan of actions would, in general, be guided by the assessment of the outcomes of already executed actions. Assessing the state of an environment and/or the consequence of one's own action is based on *judgement*, that is, the capability to gather relevant evidence, to evaluate and to arrive at conclusions. *Understanding* a situation involves the successful utilization of available knowledge to *assimilate* the situation, or of enlarging the knowledge base (i.e. adding to available knowledge) to *accommodate* to the situation. Judgement is thus an essential aspect of understanding. The notion 'desired-for-change' involves a valuation process. Many alternative goals may be potentially desirable, but it may be possible to strive for only one at a time; or only a few may be accessible in a given circumstance. So goals would have to be ordered (ranked or weighted) on the basis of their *value* as evaluated by the agent. Of course, the values assigned to goals may change from time to time or be based on the prevailing circumstances. In any case, one must clearly predicate a *value system* as underlying the functioning of an agent. At the most primitive level, this value system could only be based on the innate motivational states of the agent. Subsequently, the motivational states underlying agentive behaviour should be assumed to get augmented and modified on the basis of the past behavioural interactions of the agent with the world and their outcomes.

It is to be noted that the italicized terms above in the description of the agentive aspect of an organism are theoretical constructs. These theoretical constructs arise in a natural way, if we try to account for goal-directed activity on the part of an agent in a systematic manner from an information-processing point of view. Any viable information-processing model of an agent (set up to generate Type I explanations) must, of necessity, come to grips with these constructs and account for these agentive aspects of behaviour in terms of structures and functions incorporated in the model. The study of such information-processing models is a study of computational structures and computational processes capable of realizing the kinds of behaviour under analysis.

However, it is clear that controlled *exploratory experiments* would have to be performed in great detail before the nature of specific behaviour—specific action schemata—of an agent can be articulated. An experimental framework is also needed to test partially articulated theories as regards their acceptabi-

lity. The major methodological problem that arises in this context relates to the fact that aspects of an agent can seldom be isolated in order to study the nature of specific actions or the relationship between one action and another. Any interference with the status of an agent as an integral system results quite often in the destruction of the very agentive aspect one is trying to study.

Exploratory experiments to articulate Type I explanations, it would seem, can only be conducted through indirect means, often relying upon artificial automata or, equivalently, computer-simulated models. In simulation one tries to construct an abstracted portion of an agent capable of exhibiting the specific action schemata under study. Two important constraints have to be met by a simulation model in order that this methodology may form the basis for viable theory construction:

(*i*) The simulated behaviour must be an acceptable copy of the observed behaviour of the natural organism under study;
(*ii*) The simulated model must lead to testable hypotheses for incorporation in Type II explanations; or, at least, the model should provide relevant guidelines for exploratory investigations in physiology and anatomy.

This second requirement implies that Type I explanations cannot be constructed arbitrarily without taking into account related Type II explanations. In particular, if the behaviour under consideration goes through well-definable maturation stages, then the simulation model must be capable of coping with such developmental aspects. (See Narasimhan [1981] for a more detailed discussion of these and other constraints as they apply to the formulating of Type I explanations to elucidate behaviour in the language modality).

During the last two decades or more computer scientists interested in modelling intelligent behaviour have been experimenting with computer simulation models under the rubric 'Artificial Intelligence Studies'. Not all these studies have been concerned with elucidating the agentive behaviour of real biological systems. However, computer simulation studies to articulate Type I explanations are increasingly becoming accepted approaches for theory construction in the cognitive sciences and the neurosciences. (For a recent good review of some of these attempts, see Caplan [1987].)

In concentrating on Type I explanations we may say that, in some sense, we have been addressing problems belonging primarily to the psychological domain. When we move on to Type III explanations relating to individual behaviour, as we have already noted in Section 4, we increasingly begin to confront sociological determinants of behaviour. Type III explanations would, of course, be in the nature of socio-psychological 'laws'. Among the agentive aspects that we have outlined in this section, belief structures, judgements, and value systems are perhaps the ones most clearly influenced by sociological factors. It is not at all clear how, based on our current level of understanding

of socio-psychological phenomena relating to these agentive aspects, one should go about constructing information-processing models to simulate these aspects of agentive behaviour. Modelling these aspects becomes particularly difficult, because any viable model must consistently take into account explanations of all the three types simultaneously. Psychological theories dealing with these behavioural aspects—such as personality theory, belief theory, motivation theory, etc.—are also the ones which are most difficult to formulate in objectively testable ways. Nevertheless, just these aspects of individual behaviour would seem to be of maximum consequence when we want to understand social development or social change. The question whether sociology is ultimately reducible to psychology assumes significance precisely in this context. (See the arguments and counter-arguments by Homans and Blau [1970]). But it is clear that the real issue is not one of reducing sociology to psychology but one of *extending* viable information-processing models of psychology to take meaningfully into account the social determinants of individual behaviour. Needless to say, we are very far from being able to make any headway at present in these conceptually and computationally intractable problem areas.

So much for the behavioural domains where psychology and sociology more or less overlap. But what about sociological phenomena outside of these domains? What can we say about sociological theories relating to these phenomena? We shall briefly consider these questions now.

6. Social Facts and Social Theories

In discussing social phenomena, I shall restrict myself here to the sociology of language-using animals, i.e. human beings. Sociology of the non-language-using animals would seem to be almost entirely determined by biology. I find the abstractions 'role' and 'role playing' extremely productive concepts in constructing models of socio-psychological behaviour. I believe this to be true even with reference to information-processing models of such behaviour, although, right now, we do not know *how* to construct information-processing models incorporating these concepts. The roles that non-human animals play would, then, seem to be all biologically determined (although specific sociological environmental factors may be prerequisites to realize/elicit some of those roles). Most roles that human beings play would seem to be culturally determined. While it is true that ultimately human role playing is made possible by biological mechanisms, what are of consequence here are the boundary conditions set by cultural factors for the functioning of these biological mechanisms. And, of course, it is language behaviour that acts as a mediator between culture and biology in this context. In this sense, I tend to believe that language behaviour is a critical bridge between sociology and psychology. We shall return to this point again a little later.

Social scientists—sociologists, especially—have, of course, taken note of

this central importance of language to social behaviour by including it as one of the prerequisites of a society. The basic functional aspects of a society are taken to be the following (see, for example, Bottomore [1962]):

(1) Communication based on language;
(2) Structures and processes for the socialization of new generations (e.g. family, education);
(3) Structures and processes for the production, allocation, and consumption of material goods (i.e. systems of economics);
(4) Structures and processes for protection against external and internal threats (e.g. systems of authority and power);
(5) Structures and processes for promoting social cohesion and relieving individual distress (e.g. religion, rituals, festivals, etc.).

The argument is not, of course, that all societies exhibit all these aspects developed to similar levels of complexity. At the basic level, then, sociological studies presumably would be descriptive and would be concerned with identifying and describing the social structures and processes that do exist in given societies, or have existed in historical societies. Social studies become progressively more complex as one tries to construct *analytic models:*

(1) Of the structures and processes constituting a single functional aspect of a society (e.g. economic models):
(2) Of the historical transformations (i.e. changes or developments) in a single functional aspect of a society (for strictly economic models of economic growth, [see Rostow 1960]);
(3) Of the interrelationships between two or more functional aspects of a society (for the relationship between religion and the rise of capitalism [see Weber 1976]; and for psychoanalytic models of social change, [see Hagen 1962], etc.).

It is my view that, exactly as in case of psychological models of individual behaviour considered earlier, sociological models of the kinds (1), (2) and (3) above, in order to be viable, would have to be computational and information-processing-oriented or, in other words, systems-oriented. The third category of models are the ones likely to prove to be the most important ultimately from the view-point of application. However, we may have to learn to construct models of the first kind as a first step. Economists, of course, have been the most successful in constructing such models. But the moment we try to come to grips with change (i.e. try to model 'growth'), the limitations of these, otherwise successful, economic models become evident. Inadequacies arise in most cases, because these economic models do not take into account what we earlier referred to as the socio-psychological aspects of individual behaviour. Idealizations of such behaviour in terms of rational models of choice-behaviour and so forth would seem to be highly restricted as regards their applicability to real-life situations.

How would one go about constructing more viable and more realistic systems-oriented models of social phenomena? How would one test the adequacy of the models one constructs? What are likely to be productive research strategies in this context? Let me end this paper by making some comments on these issues.

7. Some Comments on Research Strategies

Both in psychology and sociology, theory-construction has been either highly fragmented and *ad hoc* or grandiose and too superficially global. People like Hebb [1959] and Merton [1957] have criticized adequately the uselessness of extremely polarized theories of these kinds. As I have emphasized in many places in the earlier sections, theories with practical value, and whose adequacy can be tested meaningfully, must span two or more modalities of behaviour in the case of psychology, and two or more functional aspects of society in the case of sociology. In our current state of ignorance of the system-theoretic details of both individual organismic behaviour and social structures and processes, it would serve no purpose to be too ambitious and to attempt to cover too much ground at one go. A workable strategy is to identify middle-sized problems (Merton's phrase is 'theories of middle-range') which have significant complexity of manageable dimensions.

In psychology, significant task environments to model are behaviour involving the language modality and one or more sensori-motor modalities (e.g. speech+vision, speech+vision+locomotion, speech+vision+manipulation, etc.). Our concern is not with constructing any *ad hoc* workable engineering models (although even this is difficult enough and cannot be attempted with our current available know-how and understanding). Our concern is precisely to work out computational models which would provide Types I, II and III explanations in a consistent and coherent manner wherever relevant. The above task environments can be used as bases for realistic explorations in theory construction. These task environments are non-trivial and sufficiently close to real-life complexities. Theorizing can be attempted incrementally, and the results can be cumulated. The task environments are sufficiently well defined for us to discern when we are making progress and when we are not. All these aspects are significant facilitating factors to meaningful behaviour modelling at the systems level.

In sociology it is not so easy to suggest analogous problem-domains for exploratory work. It is not clear at present how one would go about testing through computational means system-theoretic models spanning two or more functional aspects of society. The tests that can be readily visualized are either limited to field experiments involving controlled social structures and processes or contrastive analysis of historically comparable situations. Both

these techniques are, of course, familiar to sociologists. The more important issue in research methodology here may be asking the right questions.

We saw earlier that language behaviour is a critical bridge between sociology and psychology. An interesting and, in the Indian context, an important question is: How does literacy affect individual behaviour and societal structures and processes?'. Although all of us acquire our competence in language behaviour in the oral mode as a matter of course, literacy (i.e. competence in reading and writing) is a skill that is acquired only with much effort and after a long period of explicit tuition. Why should this be so? Historically, writing is a relatively recent invention. Are there discernible differences in the sociology of literate and non-literate societies, both historically and contemporaneously? More interestingly, is there a homology between these differences at the level of individuals and that of societies?

In the past two decades, studies on the characterization and implications of literacy have been growing rapidly in the West. Literacy, it has been claimed, played a crucial role in the historical development of Western societies by providing a foundation for scientific enquiry and method, democracy and bureaucracy. Alphabetic literacy, script literacy, textual literacy have each been identified by different scholars as *the* principal factor contributing to the transformation of the West in the historical context. These studies have been criticized in detail by other scholars for their parochialism and narrow reading of history. It is now generally agreed that literacy *per se* (whether alphabetic, script, or textual) does not give rise to changes in world-view and behavioural practices either at the individual or at the societal level. What are of importance are the *uses* made of literacy, the institutionalized and technical spin-offs that literacy engenders, and the effects that such spin-offs have on the behaviour of individuals at large. Historically, all such facilitating factors seem to have come together in the West and given rise to the psychosocial changes that one usually identifies with 'modernization' (see Narasimhan [1987] for a detailed analysis and discussion of the issues involved here).

A comparative study and analysis of the Indian tradition should throw much light on the developmental differences between this tradition and the Western European one. A highly evolved textual tradition flourished in India for at least 2500 years, and yet *texts* remained strictly products in the oral domain. Sophisticated interpretation assignment techniques were developed and systematized to deal with such orally transmitted texts. These interpretations as well as the aids to arrive at these interpretations were themselves composed as further texts for memorization, transmission and preservation. The mnemo-technics devised in these contexts were adapted to support the development, teaching and preservation of structurally complex performing art forms and craft skills. In other words, although the Indian tradition, in the large, was an oral tradition, it functioned within a highly literate framework. This mode of functioning continued to be the tradition for a long time, well after the introduction of writing to support literate activities. Writing, for the most part, was looked upon only as a support to memory and recall.

Quite naturally only a small part of the population was involved in these literate activities. In the absence of widespread script literacy, literate props to conceptualization and to behaviour could only have arisen at large through indirection and feedback from the textual tradition. Some interesting issues to analyse in this context are as follows:

(1) Were there any such feedbacks? If so, what were their characteristics?
(2) How did these feedbacks contrast with the corresponding ones in the West European culture, for example, in administration, jurisprudence, science, engineering, craft, art, and so on?
(3) In contrast to the situation in Europe, were there intrinsic differences and limitations in the Indian textual tradition itself because of its exclusively oral nature? In other words, were there intrinsic limitations to the methodologies, conceptualizations, logical formalisms, and so forth? If so, how did these manifest themselves in the feedback process, for example, in scientific enquiry?

It is of critical importance to analyse the nature and extent of the influences that the textual tradition and the active textual literacy practices in India had over individuals and institutions in the historical context. This analysis is essential to understand why the Indian tradition at large, despite its literate underpinnings, continued to exhibit 'non-literate' characteristics along a wide variety of psychosocial dimensions. For example, there was no effort to discriminate systematically between myths and history; between beliefs in the supernatural and a rational analysis of natural phenomena; between disputatious, polemical arguments and comparative, critical, analytical studies; between a didactive approach to enquiry and a reflective approach to it.

Analogous studies of the Chinese tradition should be of much comparative value since that tradition, unlike the Indian one, used both script and images (diagrams) for representational purposes. In this sense, China was closer to Europe. Nevertheless, the early achievements of China do not seem to have led to later developments comparable to those in Western Europe. One would like to understand the reasons for this.

Issues such as these seem to me to be important problems to study, not necessarily because such studies are likely to result in immediately applicable results, but because they are likely to enlarge our understanding of human beings and social structures and processes from a system-theoretic viewpoint. And, as we have discussed in detail earlier, such an understanding is a prerequisite to viable theory construction in the social sciences.

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The Marxist conception of tradition*

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Making an analysis of Marx's conception of tradition as a mechanism of preserving and advancing culture appears to be important for at least two reasons. Firstly, this is essential for an objective appraisal of the Marxist legacy. It is known that the revolutionary spirit of the teachings of Marx that are aimed at abolishing the social relations of exploitation and building a socialist society of the future makes it possible to oversimplify and sometimes even to distort his attitude to tradition as such. And then innovative, reorganizing activities and tradition are erroneously portrayed as being in antagonistic contradiction.

Secondly, Marx's understanding of tradition is very relevant today in connection with the problem of social progress which has acquired particular urgency and importance to the nations that have gained political independence.

One would not find in Marx's works any definition of the notion of tradition. Moreover, both he and Engles frequently spoke very negatively about the traditions of the past. 'The Communist revolution', they wrote, 'involves the most radical rupture with traditional ideas.'[1] Taken out of their contexts, this and other similar quotes to the effect that 'tradition is a great retarding force'[2] and that 'the traditions of all the dead generations weights like a nightmare on the brain of the living'[3] may prompt the false conclusion that Marxism negates the positive potentials of tradition. But a more careful study of the dialectical-materialistic method in analysing the essence and mechanism of action of tradition allows its adequate Marxist assessment.

The history of humanity qualitatively differs from the history of the animal world by its cultural continuity. Drawing attention to precisely this distinguishing feature of the development of human society, Marx and Engels said in *The German Ideology* that each new generation finds present

> ..a material result: a sum of productive forces, a historically created relation of individuals to nature and to one another, which is handed down to each generation from its predecessor; a mass of productive forces, capital funds and conditions, which, on the one hand, is indeed modified by the new generation, but also on the other prescribes for it its conditions of life and gives it a definite development, a special character.[4]

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An oversimplified understanding of continuity may be reduced to the following formula: 'The past determines the present, the present determines the future.' This schematization of social development is ascribed to Marxism by Karl Popper. But Marxism is far from this understanding of the mechanism of development. It is only *partially* that the past determines the present. The domination of the past over the present is not a universal law, but a specific historical situation. The decisive factor in ensuring historical continuity is *creativity*.

Tradition, if it is understood as 'a certain type of relations between the successive stage of a developing object.. where the old goes over into the new and productively 'works in it'[5] has its specific forms of manifestation in various spheres of social life and cognition.

I would like to dwell here on the Marxist approach to tradition in the field of philosophy, more precisely, on the attitude of Marxism to the philosophical tradition of the Orient.

It is known that there are two extreme points of view on studying and evaluating any philosophical tradition. One is that an objective study of a philosophical tradition can only be done by an impartial 'outsider'. This standpoint was expressed most clearly by the adherents to 'the philosophy of the history of philosophy'. An 'outside' view by itself does not warrant, however, the objectivity of an analysis and the conclusions following from it. This approach is perhaps a guarantee against subjectivity that is typical of the devotees of this or that philosophical system. But it does not rule out the very likely subjectivity of another kind, namely, the subjectivity of a study that is determined by its underlying world outlook that is 'alien' to the system under examination. 'Outside observation' by itself does not at all exclude the danger of an egocentric approach which is manifest most vividly, for example, in all manner of Eurocentric appraisals of the spiritual legacy of oriental nations.

The overtly supercilious attitude to the spiritual values of these nations, which was spread fairly widely in the West in the era of colonialism, often took the form of blatantly racist contentions. A.E. Gough, a European expert in Indian Studies, claimed for one that Indian philosophy had been evolved by thinkers of an inferior race, a nation of a stagnant culture, whose intellectual development proceeded outside the mainstream of development of human reason.[6]

It should be acknowledged, however, that outright racist rantings are rather rare in the present-day world, since the collapse of the colonial system has precipitated radical changes in relations between the Occident and the Orient.

But Eurocentrism may also reveal itself in less visible forms. Moreover, it does not necessarily have political or missionary motivation. There are quite objective causes of the origination of Eurocentric (as well as Orientocentric) views, which are connected with a really different nature and specifics of Oriental civilizations as compared with Western civilizations, and hence

the difficulty of mutual understanding. Trying to delve into the mysteries of a 'foreign' culture, researchers are involuntarily apt to apply to it the schemes, yardsticks and terminology of their own culture, thereby dragging Eurocentrism through, so to say, by the 'back entrance'.

Paradoxical as it may sound, the Eurocentric positions are also shared by some Asians and Africans themselves. A propensity to look at their national culture and philosophy from the standpoint of Eurocentrism is especially characteristic of those Oriental intellectuals who have received European education and, therefore, stand on the positions of 'modernism', which calls for reorganizing traditional societies according to the Westetn bourgeois model. The Eurocentric approach may also be assumed involuntarily by 'reformers' who advocate the need to effect social changes by 'synthesizing' the progressive national traditions with the achievements of the bourgeois Western culture. Not infrequently, they stretch their point too far in presenting their case, because they want by all means to find resemblance and points of contiguity between the phenomena, notions and categories of Oriental and Occidental cultures. And then, for example, they portray the famous Persian Jalālu'l-Din Rumi, a Ṣūfī poet of the thirteenth century, as a philosopher who was 200 years ahead of the West European Renaissance; and who put forward the concept of 'the harmoniously developed Man' which is how Sufi literature describes the traditional idea of the 'perfect man' (al-insanu-l-kamil) and which is a great contribution to the wellbeing of the present-day Western Man and, more so, to the development of communist society.[7] Or they stubbornly assert an analogy between the atomistic system of the doctrine of al-Ash'ari (tenth century) and the monadology of Gotfried Wilhelm Leibniz (this is done by Pakistani M.M. Shariff, Indonesian M. Natsir and others). Or, finally, they make the Medieval Arab thinker ibn Khaldun (fourteenth century) into a 'historical materialist', with modern Marxism viewing his works as its childhood.

So an 'outside view' by itself does not ensure the scientific objectivity required for a historical and philosophical study. Moreover, as was pointed out above, it is fraught with the danger of a subjective approach. But the opposite view that an authentic understanding of the essence of phenomena is possible only on the condition of a full assimilation of the material under study is nothing better.

It is known that the need to assimilate the thinking by images and notions of ancient authors was stressed already by Spinoza in his criticisms of biblical texts. His idea was further developed by F. Shoemaker, William Dilthey and other philosophers who tried to fuse it with Hume's conception of empathy.

The idea that it is possible to understand the past by assimilating it, which is rather popular among historians, philologists, ethnographers and other social scientists, can be interpreted in different ways. It may imply psychological assimilation (including that of historically remote consciousness). This

method can be effective only in individual cases while, on the whole, the concept of intuitive assimilation

> ..remains at best a means of psychologically reconstructing another's individual consciousness, based on an analogy between one's own and the other's egos..Since the state of the historian's individual ego may change depending on many reasons (the mood, age, education, personal characteristics, etc.), historical reconstruction..ceases to be rational, that is scientific, irrespective of the author's wish.[9]

The culturological understanding of assimilation as a comprehensive knowledge of culture and its appraisal from the standpoint of the integrity of its institutions is much more justified. Taking precisely this approach in studying the consciousness of peoples with tribal relations, Claude Lévi-Strauss, a prominent structuralist ethonographer, rejected the presumption about their 'primitiveness' as compared with representatives of the modern industrial society, selecting as the point of departure the premise about the 'allogenic nature' of the consciousness of a member of a primitive commune, which enabled the French scientist and his followers to make a big contribution to the study of archaic cultures.

While recognizing the fortes of this approach, one cannot but take into account also its weaknesses. Assimilation that has been brought to its logical conclusion, for example, may turn the scientist into an adherent of the philosophical system he is studying and this deprive him of, or at least reduce, his ability to maintain a sober and critical attitude to the object of study. An 'inside' view may lead (when the matter at issue is the subject of Oriental philosophy) to Orientocentlism which is just as insolvent scientifically as its antipode Eurocentrism.

The objectivity of an analysis, thus, does not depend on whether a researcher takes an 'outsider's' or an 'insider's' approach to a historico-philosophical subject. It depends, however, on the methodological principles he proceeds from, on his *Weltanschauung*.

It is not an 'outside' or an 'inside' view but the taking into account of the 'internal' and 'external' measurements of philosophical knowledge itself that is of principled importance to gaining an adequate interpretation of a philosophical phenomenon. Ignoring the regularities of development of philosophy as a specific form of social consciousness is just as dangerous as absolutzing its independence, which leads to the substantializing of philosophical thinking and to the burying in oblivion of the significance of socio-historical practice and the 'sociological' measurement of the philosophical process that has been discovered and substantiated by Marxism.

It is not less important to measure philosophy in comparison with the other parts of the ideological superstructure, that is, not to leave out of the field of vision a kind of 'mean measurement'. Taking the latter into account, especially in studying philosophy and religion, assumes particular significance in historico-philosophical studies of the Orient.

As is known, it is accepted in bourgeois historico-philosophical literature to regard idealism, irrationalism and, in a large measure, mysticism as properly Oriental philosophical traditions. It would be a mistake to view such conclusions solely as the deliberate defiance of the multiformity of Oriental philosophical traditions and their international bringing to a common denominator. The matter is much more complicated. The above conclusions were partly prompted by the fact that new ideological conceptions in the Orient are often expressed in traditional categories and terms. This tradition of stable terminology was pointed out by many experts in Oriental Studies both nowadays and in the past. S. Georgiyevsky, an eminent Russian Sinologist, for example, described Confucius as an innovator 'with the character of an advocate of old ways and conservatism', explaining this in the following way:

> Confucius realized that the mass is hostile to any kind of innovation and that it worships authorities and likes what has been sanctified by time. This is why he found it necessary to infuse his teachings into old forms.[10]

But the matter apparently is not only the subjective factor (which plays an undoubtedly important but by no means the decisive role) but also the specifics of the objective realities of the oriental world, the conservatism and tremendous inertial force of what has not yet been explained by scientists but nevertheless has a special name—'the Asian mode of production'.

Attachment to the customary form of expression does not fully rule out, however, the possibility of the existence and struggle of opposite ideas, although such conservatism certainly complicates, if allowed at all, an open expression of non-traditional ideas. The history of philosophy in the Orient is, in the same measure as it is in the Occident, a process of dialectical development, whose general regularity is the struggle between materialism and idealism. The specific nature of 'Asian society' does not preclude this general regularity. It only determines the peculiarity of its manifestation in the Orient. Conservatism in terminology, mentioned above, is one concrete embodiment of this peculiarity.

Contentions that there is a general regularity of the historico-philosophical process do not rule out, as is known, the recognition of the fact that the correlation of forces between the two polar trends—materialism and idealism—may vary depending on time and place. Scientific data do not yet provide grounds for concluding with full certainty that materialistic trends were just as widespread in the Orient as they were in Europe. But neither do they make it possible to claim that they were insignificant, more so non-existent. Historical justice and scientific objectivity demand that much attention be paid to studying materialistic views in the Orient, which have to this day been largely ignored by historico-philosophical science.

A careful study of conflicting trends in the frameworks of the same philosophical systems (usually regarded as idealistic) could be promising in this respect. Working in this direction, Marxist historians of philosophy have been able to show convincingly that, say, in the framework of philosophical Taoism, there coesixted Liezi (fifth-sixth centures B.C.) and Wan Chuhe (first century A.D.), whose views of the world were basically materialistic, and consistent idealists Huai Nanzi (second century B.C.) and Ge Hong (fourth century A.D.); that in medieval Chinese philosophy the Song school was represented by the natural philosophy of Zhou Dun-yi (eleventh century) and Zhan Zai (eleventh century), which were rich in materialistic ideas, and by the idealistic metaphysics of Cheng Hao (eleventh century), Cheng Yi (eleventh century) and Zhu Xi (twelth century); that coexisting in the Japanese medieval Zhu Xi school were the speculative metaphysics of Fujiwaru Seik (sixteenth-seventeenth centuries) and Hayashi Razan (sixteenth century) and the natural philosophy of Kaibar Ekken, which was saturated with materialistic ideas; and that the ancient Indian philosophy Sāṅkhya comprised along with idealism also materialistic ideas connected with the name of sage Pañcaśikha.

Attention should, however, be paid to possible—and sometimes occurring excesses here—cases when what is not materialism is portrayed as such. It is relevant to recall in this connection the warning by Hegel that 'it is just as foolish to think that any philosophy can go beyond the bound of its contemporary world as to believe that a certain individual can jump his epoch'. Inexcusably vulgar, therefore, is an approach which does not take into consideration the historically determined limitations and inconsistency of the materialism and rationalism of the past and the possibility of not only their opposition to their antipodes—idealism and irrationalism—but also their coexistence with them in the framework of the same philosophical systems.

An examination of the philosophical tradition of the Oriental nations as part of the single global process of spiritual development prompts the possibility of identifying there, along with the 'obscured' traditions of materialism and rationalism, also the ideas of humanism and social justice. This is especially important in conditions of the present-day ideological struggle where the question of what road of development to choose has arisen before the newly free nations of the Orient as a matter of top priority. Deliberately distorting the national traditions of the Oriental peoples, the enemies of socialism are seeking to prove the incompatibility of their spiritual traditions with the ideas of socialism. Those who join Roger Garaudy and Maxime Rodinson in claiming that the cultural legacy of the Oriental peoples, which is fully identified with their religious legacy, in particular, Islam, makes it possible to speak about the 'socialist' character of the Moslem dogmas, go to another extreme. Such unfounded claims do not only distort the history of spiritual development of the peoples of the Orient, they also hinder their quest for the road of really independent development. While accentuating the ideas of equality and social justice contained in the cultural legacy of the oriental

peoples and disproving the thesis that socialism is 'basically alien' to them, one should not at the same time close one's eyes to the historically determined limitations of these ideas in the past.

When identifying the regulations of development of the history of philosophy that have been discovered by Marxism and demonstrating them on the example of Oriental material, it would be a mistake also to oversimplify the complexities of the historical process of thinking, reducing its motely picture to just two colours—black and white. I would like to recall in this connection the demand by Aristotle, who was in effect the first historian of philosophy, that we should be 'fair and grateful to the predecessors', including 'not only those whose opinions we may share but also those whose judgments were more superficial, for they, too, made a contribution to the quest for the truth, exercising before us the ability (to cognize).[11] And although the ancient Greek philosopher himself failed to remain committed to the principle of objectivity he had advanced, this does not mean that we should not seek its implementation.

Notes

1. Karl Marx and Frederick Engels, *Selected Works*, Vol. 1, Moscow: Progress Publishers, 1976, p. 126.
2. ———, *Selected Works*, Vol. 3, Moscow: Progress Publishers, 1970, p. 113.
3. ———, *Selected Works*, Vol. 1, Moscow: Progress Publishers, 1976, p. 394.
4. *Ibid.*, p. 42.
5. A.G. Spirkin, 'Man, Culture, Tradition' in *Tradition in History* (in Russian).
6. A.E. Gough, *The Philosophy of the Upaniṣads and Ancient Indian Metaphysics*, London, 1982, p. 6.
7. A.R. Arasteh, *Rumi, the Fersian: Rebirth in Creativity and Love*, Lahore, 1965, pp. 166, 189.
8. M.M. Sharif, 'Dialectical Monadism' in M.M. Sharif, *The Contemporary Indian Philosophy*, London, 1952.
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Science and truthlikeness*

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I

Many philosophers, notably Karl Popper and his followers, believe that science aims at truth, and that the progress which a science can make from an earlier to a later theory is a matter of their comparative degrees of *truthlikeness*. This is the only way, they further believe, for 'truth' to play its central role in scientific realism (henceforth SR) as an account of *how* scientific progress is possible or *what* makes it rational. It is my aim here to suggest that there is a need to set new priorities for SR making it a dynamic framework to account for all this without making either of the two kinds of assumptions just alluded to.

II

If there has ever been anything which has given enough trouble to the scientist as well as to the philosopher without matching results, it is, I think, the problem of truth. For them both, this has been the most difficult and yet confusing of all the problems. This is corroborated by the recent and current realist-relativist and instrumentalist-realist controversies as to the nature of the framework(s) within which science pursues its aim of understanding the workings of the world we are born in. Or notice how this is borne out by the statement made by the staunchest advocates of realism like Karl R. Popper.

> One great advantage of the theory of objective or absolute truth is [observes he] that it allows us to say—with Xenophanes—that we search for truth, but may not know when we have found it; that we have no criterion of truth, but are nevertheless guided by the idea of truth as a *regulative* principle (Popper 1972a: 226; also Popper 1983).

Similar elusiveness is faced, on the other hand, if we want to distinguish objective truth from relative truth, taking the latter, in a somewhat subjective sense, as a property not of statements/theories but of (our) *beliefs*. For while doing so one may be easily persuaded to embrace relativism as the view that different conceptions of 'truth', as those of 'meaning', 'reality', 'rationality' and so forth, are constitutive of different societies/language communities. It may not be, therefore, surprising if we find that Popper's following diagnosis

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is basically wrong: 'The dangerous confusion or muddle which has to be cleared up is that between truth in the realist's sense—the 'objective' or 'absolute' truth—and truth in the subjective sense as that in which I (or we) believe? (Popper 1972a: 402). Although I believe that it is erroneous to hold with Popper that 'the only important problem of knowledge concerns the problem of truth in the objective sense' (Popper 1972a: 402), let us have a closer look at some of the attempts to solve this problem, notably those of Popper, Tarski, Otto Neurath and Nelson Goodman among others.

How should we, first of all, distinguish between SR and its rivals such as instrumentalism? Although SR is generally associated with those theorists who maintain, among other things, (1) that 'truth'/'falsity' is an objective property of (our) theories of the world and (2) that, in this context, the truth of a statement consists in its correspondence with 'facts' (Popper 1972a: 223-31), I think that the coherence theorists who subscribe to (1) but not to (2) have an equal claim to this title. If we may formulate SR as a set of theses (1-6) as follows, we may say that a coherence theorist is one who subscribes to all but (5) and (6), while an instrumentalist is one who, true to his scepticism about the cognitive status of theories, denies all but (1) and (2):

(1) That the reality and independent existence of the world is disclosed to us not only by our innumerable interactions with it, from most lose-ended to most intimate, but demonstrated by the very fact that without *assuming its* independent existence the cognitively oriented problem-solving systems like the human mind, language and science would cease to be characterized by intentionality.
(2) That the availability of the world, thus assumed as a world for us to interact with significantly, is strictly a joint function of these cognitively oriented systems themselves. That is to say, there may be no other way for us to enter in significant (=controlled) interactions with *it* than the one codetermined by these systems.
(3) Science aims at a *true* (or approximately true) description of this world by means of theories which may explain why the observable phenomena obey the laws that they do.
(4) A scientific theory is, therefore, objectively either true or false.
(5) The intuitive idea of a theory's truth, in this context, is the idea of its correspondence with *facts*.
(6) It is then this idea which an adequate theory of truth may be expected to give us a precise definitional account of.

As one moves more and more away from philosophy of science and objectivistic epistemology, one will come across semantical approaches to the concept of truth based on the idea of an hierarchy of languages, on the one hand; and those approaches, on the other hand, which openly advocate relativism in some form or other. As an example of the former type of approach

one must naturally consider Alfred Tarski's classical attempt to *explicate*[1] this concept as a semantical relational predicate, if only relative to the restricted class of formalized languages (Tarski: 1956: 152-278). Tarskian semantical conception of truth (henceforth SCT) derives from the formalistic tradition of Rudolf Carnap and Tarski himself, where it is thought necessary to think in terms of a great *divide* between such languages and the more familiar ordinary natural languages which are too complicated to grapple with the liar paradox and things like that. Interestingly enough, the merits and the consequences of Tarski's SCT, as those of the work of Carnap, have in the recent years crossed the boundaries of STC's intended scope. STC has inspired philosophers, working in different fields from philosophy of the sciences to that of the natural languages. Thus, Donald Davidson's (1967) truth-conditional semantical approach to *meaning* is based by him on the assumption (unacceptable to Tarski) that Tarskian techniques of truth-definition, particularly his (*T*) schema—(*T*) *S* is true iff *p*—can be fruitfully extended to the natural languages.[2] In some cases, notably in Karl Popper's, Tarski's SCT has even led to significant changes in their philosophical frameworks. Thus, when he wrote his *Logik der Forschung* (1934), Popper seriously believed that it was possible as well as safer to formulate a complete theory of scientific progress and rationality without any reference/commitment to a specific conception of truth or truthlikeness. But, as his later work (1972a, 1972b) shows, it is under a strong influence of Tarski's SCT that he has been persuaded to give up this assumption altogether.[3]

First of all, let us consider what kind of enterprise a Tarskian enterprise really is. Tarski sets himself the task of defining 'truth' by constructing—'with reference to a given language'—'*a materially adequate and formally correct definition of the term "true sentence"*' (Tarski 1956: 152). I think that it would be quite correct here to look at Tarskian SCT as an *explication* in the sense of Carnap, i.e. a task of making more exact a vague/familiar concept, used in everyday life or in an earlier stage of scientific or logical development by replacing it by a newly introduced well-defined concept (Carnap 1956: 7-8). This naturally entails a number of important constraints for any serious attempt to define 'true sentence' for a specified language. It is essentially in terms of these constraints that it should be possible not only to fix the *intension* and the *extension* of the semantical predicate 'true' but to reject any theory of truth that is inconsistent with these constraints. Tarski's material adequacy condition, then, helps us in fixing the extension of the predicate 'true', since it lays down that any adequate definition/explication of it should have as a consequence all instances of the (*T*) schema—(*T*) *S* is true iff *p*,—where *p* is replaceable by any sentence of the *object language* for which the predicate 'true' is being explicated and *S* is replaceable by a name of the sentence which replaces *p*. It is perhaps at this very point that one could see why Tarski and others like Popper claim that the SCT can be taken as a *rehabilitation* or an elaboration of the insights in the classical theory that takes truth as correspondence to the facts. On the

other hand, Tarski's formal correctness requirement relates to the structure of the metalanguage *in* which the definition of truth should be given. Entailing, as it does, a clear object/metalanguage distinction, itself conceived within a broader framework of a whole hierarchy of languages, Tarski requires that in a given case the structure of both the object language and metalanguage should be 'formally specifiable'; and that a formally correct definition of truth should be expressed in *a* language which is not *semantically closed.* Thus, Tarski recognizes the difficulties of the problem concerning the concept of truth—a concept which 'shares the fate of other analogous concepts in the domain of the semantics of language' (Tarski 1956: 152; 162-64). What Tarski has here especially in mind are the paradoxes[4] and antinomies which the philosophical investigations in the past using this concept landed themselves in. Tarski argues that our everyday/colloquial language is characteristically or typically *universal;* and, therefore, any enterprise seeking to define 'true sentence' for this *language* is bound to violate its very spirit, on the one hand, and the laws of logic, on the other (Tarski 1956: 164-65). Hence such an enterprise is impossible. Of course, if one insists on it, Tarski observes, then, first of all, he would have to undertake the task of so reforming our everyday language as to render it beyond recognition, i.e. something that young Wittgenstein's attempt in his *Tractatus Logico-philosophicus* to conceive of our language as a calculus did.[5] By the universality of our everyday language Tarski understands the following feature in it: '...that if we can speak meaningfully about anything at all, we can also speak about it in colloquial language' (Tarski 1956: 1964).

> If we are to maintain this universality of everyday language in connection with semantical investigations [he argues] we must, to be consistent, admit into the language, in addition to its sentences and other expressions, also the names of these sentences and expressions, and sentences containing these names, as well as such semantic expressions as 'true sentence','name', 'denote', etc. But it is presumably just this universality of everyday language which is the primary source of all semantical antinomies, like the antinomies of the liar...These antinomies seem to provide a proof that every language which is universal in the above sense, and for which the normal laws of logic hold, must be inconsistent' (Tarski 1956: 164-65).

It is, of course, not possible to understand the deeper significance and implications of Tarski's argument without recalling his important assumption of a whole hierarchy of languages and his object/metalanguage distinction. Tarski is very well aware of the fact that the problem of truth, as he understands it, is inherited by us from the classical questions of philosophy, from the classical conception of 'truth' as correspondence with reality, and from the everyday intuitive use of this semantical category (Tarski 1956: 152-53). Yet, there is a deeper awareness in him that this problem needs to be reformulated.

It is with this awareness that he looks at our everyday language, and finds it typically *universal* which points to its semantically closed character. It is then from its semantically closed character—from the fact that it always and in every situation carries its metalanguage *within* itself—that he argues to the impossibility of any enterprise of constructing a satisfactory definition of 'true sentence' for it, which is both materially adequate and formally correct in his sense. It is primarily for this reason that Tarski turns to formalized languages that are not semantically closed, thereby reformulating the whole problem in a radically new and interesting manner. The resulting problem demands that, given an object language L_o, the concept 'true sentence in L_o' must be defined in materially adequate and formally correct manner such that the metalanguage L_m that contains this concept is of a *higher oder* and *richer* than L_o, and also formally specifiable. Our everyday languages being neither semantically open nor formally specifiable, any attempt to construct a formally correct definition of 'true sentence' for them must be ruled out, if one is not to land one self in paradoxes and similar entanglements.[6] The general procedure which Tarski then adopts for his enterprise has the following main steps[7]:

(*a*) A specification of the syntactic structure of the object-language L_o, for which the concept 'true sentence' is to be defined.
(*b*) A specification of the syntactic structure of the metalanguage L_m, in which the concept 'true sentence of L_o' is to be defined, where L_m is rich enough to contain:

(*i*) either the expressions of L_o, or translations thereof;
(*ii*) syntactical vocabulary, including the names of the primitive symbols of L_o, a cancatenation sign (for forming 'structural descriptions' of compound expressions of L_o), and variables ranging over the expressions of L_o; and
(*iii*) the usual logical apparatus.

(*c*) Definition of the semantical relational predicate 'satisfies-in-L_o'.
(*d*) Definition of 'true-in-L_o' in terms of 'satisfies-in-L_o'.

The reason why Tarski chooses to define 'truth' in terms of another semantical category, viz. 'satisfaction', is this: he does not want to employ in his truth-definition any semantical primitives. For various reasons his choice falls on the concept of satisfaction as a basic but definable semantical relation between *open sentences* and ordered *n*-tuples of objects. For example, the open sentence '*x* is north of *y*' is satisfied by (Kashmir, Delhi)...(Tarski 1956: 190-91; 214-15). Closed sentences such as '$(\exists x)$ *x* is a city' being special cases of open sentences, and since the problem of truth concerns these sentences, Tarski defines a sentence as *true* just in case it is satisfied 'by an arbitrary sequence of objects', and as false just in case it is satisfied by none (Tarski 1956: 195; 215).

I have been considering these aspects of Tarskian enterprise with a view not to subjecting them to a critical examination but to having another look at Popper's approach to the problem of truth. It is Popper's firm view that 'Tarski's greatest achievement, and the real significance of his theory for the philosophy of the empirical sciences, is that he rehabilitated the correspondence theory of absolute or objective truth which had become suspect' (Popper 1972a: 223). What Popper is here referring to is the intuitive idea of *truth* of a statement as its correspondence with facts. There are, however, a number of reasons warranting a cautious and critical attitude on this whole issue of the real philosophical significance of Tarski's SCT in relation to the formalized languages. Indeed, Tarski himself thinks that his theory is quite non-committal and hence philosophically neutral.[8] Perhaps, what Tarski really intends to convey by this is not so much its philosophical neutrality but its ideological neutrality between positions such as those of empiricism, idealism, naive realism and so forth. For, given the Tarskian methodological commitments, how could such an explication be considered neutral philosophically if not ideologically? It may be quite reasonable, therefore, to look for deeper philosophical significance in the Tarskian SCT. Although this is precisely what Popper claims to have found out, one is bound to feel puzzled by his non-criterial approach to *objective truth* as something which is accessible to us, despite Tarski's work, only as a 'regulative ideal'.[9] But this points to something which is clearly beyond the scope of a Tarskian SCT, however attractive it may look for purposes of building a theory of the growth of scientific knowledge. Notice, in this context, how Richard Jennings (Jennings 1983: 118-23) has argued for the view that as a definition of 'true sentence' for a formalized language in a suitably richer metalanguage Tarski's SCT is a form of relativism and, therefore, not a basis for the type of realism Popper advocates.

> Because the metalanguage is richer than the object language *only* in its linguistic and logical apparatus [he argues] because its terms for referring to the world are taken directly from the object language, the world referred to by the metalanguage is the very same world as the world referred to by the object language. We should see the world that our metalanguage tells us about as a world our object language creates. In this way we can see the semantic conception of truth as a form of relativism (Jennings 1983: 122-23).

If we argue further with Jennings that 'the metalanguage does not refer to any real world which exists independently of our theories, it only refers to the very same world to which our theories refer' (Jennings 1983: 122) the argument for relativism may seem to complete itself by implying that *the* world of the scientific realist is better taken as a world well lost. If all that the metalanguage can do is a sort of monitoring of the ontology of a world predetermined by the object language, the SCT can be seen to favour relativism instead of SR. How could it then, one may, therefore, genuinely and seriously wonder, come to a sudden rescue of SR as is suggested by Popper?

While there is much in this kind of reasoning which one may agree with, there are at least two sorts of questions which are important, and which Jennings fails to ask. First, whether Tarski's SCT can be taken to favour relativism as against realism in Popper's sense, if it is also taken as offering an analysis of the correspondence theory of truth? I think that this question could be asked differently as follows: whether relativism is not itself either an incoherent doctrine or, if it is to make sense, a form of realism (Pandit 1987)? Jenning's argument to the contrary notwithstanding, his position and particularly his criticism of Popper is, I think, undermined by his agreement with Tarski's own assessment that the SCT does offer such an analysis. I point this out, because I think that it is the realist, more than any one else, who believes in some version of the correspondence theory of truth or other. Secondly, would it not be philosophically more accurate or correct to make sense of the SCT itself within a broader framework of assumptions, viz. (*a*) the assumption of a whole hierarchy of languages, on the one hand; and (*b*) the assumption of *the* world, in which we are born, as *a* world which (our) scientific theories will always *presuppose* in common if they are to carve out their respective *worlds* to which they will then refer, on the other? By asking this question what I wish to suggest is the following: that it is *tautologous* to say that a theory/object language refers to the world which it itself creates and to correlate this with how the metalanguage, set up to monitor this, must *refer* to the same world. But there is something over and above this which it accomplishes, which does not amount to a *triviality*. What I have in mind is the following: that it is always the case that the *world* which a theory may refer to will turn out to be what it can only carve out from *the* world whose independent existence it presupposes in common with all other rival theories. It is, therefore, necessary to distinguish between the *world* which it may refer to and *the* world which, if it does, it must presuppose. Neither Jennings's argument nor Tarski's SCT implies that the metalanguage will not carry within itself a presupposition such as this, if it is already there in the object language. The world of the scientific realist is then better not taken as a world well lost.

It is not possible, in the present context, to ignore those aspects of Popper's realism where the most important aspect of a scientific theory T_1, T_2, T_3... is its progressive approximation to truth (= its everincreasing truthlikeness or verisimilitude). Thus, since all knowledge is conjectural/ fallible in character, of any given theory (*i*) what we must ask is not whether it is *true* but how good or bad approximation to truth it is, there being no way, nor any criterial means, for us to tell that it is true even when it may be true; and (*ii*) what we must resort to in order to evaluate the rival theories is the falsificationist methodology such that we may so accelerate the process of refutation of one of them as to be able to make appraisals of the following kind: the refuted theory T_1, as against the as yet unrefuted theory T_2, was after all not a good approxi-

mation to truth. The rationality of the growth of knowledge lies, then, in the fact that it inherits the Darwinian pattern of trial-and-error and survival by natural selection in the biological evolutionary history of species in our universe:

> T_1 (tentative conjecture)→*EE* (evaluative error-elimination)→P_1 (the resulting problem)→T_2 (tentative new conjecture as a better approximation to truth)...

Regulated by the (Popperian) regulative ideal of 'truth' in an absolute sense, science appears here as a game driven by the methodology of conjectures and refutations. As is natural to expect, every participant in the game has to follow certain *common rules*. These will include the following rule: that that conjecture will be the best possible candidate for a most rational/ effective move in the 'game' which comes out as a better approximation to truth than its rivals; and that one must always try to work with only such conjectures in the light of refutations of our present conjectures in science. Limitations of space prevent me here from undertaking a detailed criticism of the twin aspects of Popper's realism which I have just considered: that science is a game among games regulated by the regulative ideal of absolute/ objective truth, which should be taken as closely akin to concepts like *goodness*. That must await another occasion. But, to conclude this part of my discussion, does not this already take Popper's view, which, as I understand it, amounts to a game-theoretic view, to a point where it collapses into another form of conventionalism?

III

In agreement with Carl Hempel (1980), I think of Goodman's approach to empirical knowledge and to its rationality as reminding us of the similar views of Otto Neurath whom one should admire as the most elegant coherence theorist of the Vienna Circle of 1930s (Hempel 1980: 193). Let us consider very briefly what possible insights into the whole problem of truth Goodman may have to offer us. In his view, we cannot test a scientific theory by comparing it with a world undescribed. On the contrary: '...all we learn about the world is contained in right versions of it; and while the underlying world, bereft of these, need not be denied to those who love it, it is perhaps on the whole a world well lost' (Goodman 1978: 4). Thus 'a version is taken to be true when it offends no unyielding beliefs and none of its own precepts' (Goodman 1978: 17). Therefore, he argues:

> The realist will resist the conclusion that there is no world; the idealist will resist the conclusion that all conflicting versions describe different worlds. As for me, I find these views equally delightful and equally deplorable—for after all, the difference between them is purely conventional (Goodman 1978: 119).

In effect, all this has a strong family resemblance with Rudolf Carnap's doctrine of the conventionalism of different/alternative language frameworks as also with Popper's idea of a 'good' theory as a better approximation to 'truth' as a regulative, though highly elusive, ideal. If all that Goodman really wants to provide us with is not a definition of 'truth' but a characterization suggestive of a deeper kinship between *truth* and *rightness* (Putnam 1983: 167-69), one might then as well say that *truth* is the sort of concept where the moral and the epistemological enterprises meet. It may not be at all surprising for his whole enterprise concerning the *ways of the world making* to be deeply rooted in the conventionalism of Carnap's principle of tolerance: 'It is not our business to set up prohibitions, but to arrive at conventions' (Carnap 1937: 51). But what will remain an unresolved puzzle is the following: Carnap's conventionalism as embodied in this principle was essentially conceived by him as a principle applicable to languages preconceived as *calculi*. Thus, he thought of it as being applicable in the domain of logic, and then extended it to *constructions* of alternative language-forms in the domain of what he called the logic of science. 'In logic', he wrote in this very context, '*there are no morals*. Everyone is at liberty to build up his own logic, i.e. his own form of language as he wishes (Carnap 1937: 51 and 298-322)'. What is puzzling is that, while Goodman's enterprise has deep roots in Neurath's, which originally shaped Carnap's conventionalism to a great extent,[10] it is not open to him at all to take the concept of *truth* as the sort of concept where the moral and the epistemological enterprises may be said to meet. Yet, that is what he implies when he suggests that *the* world of the scientific realist is better taken as world well lost.

In this context, then, what is more interesting is how Otto Neurath looks at science, while he rejects the idea of an immutable empirical foundation for all (our) scientific knowledge to build on. 'There is no way to establish fully secured, neat protocol statements', observes he, 'as starting points of the sciences. There is no *tabula rasa*. We are like sailors who have to rebuild their ship on the open sea, without ever being able to dismantle it in dry-dock' (Neurath 1983: 92)'. In his view:

> The possibility of science becomes apparent in science itself. We enlarge its domain by augmenting the *mass of statements*, by comparing new statements with statements taken over from the past, thus creating a consistent system of unified science that can be used for successful *predictions*. As makers of statements, we cannot, so to speak, take up a position outside the making of statements and then be prosecutor, defendant and judge at the same time (Neurath 1983: 61).

Notice how he views science, concerned as he is with the problems of truth and demarcation, as the kind of growing enterprise which always moves from one 'system' of statements about the world to another and where 'the correctness of each statement is related to that of all the others' (Neurath 1983: 3). But at any time, as one might put it, it becomes its own anchor in the same sense in which the seafarers must stay afloat on their *only* ship, while rebuilding it *without* any possibility of taking it into a dry-dock and rebuilding it there on a fresh/firm basis. 'We can vary the world of concepts present in us', Neurath goes on to argue, 'but we cannot discard it. Each attempt to renew it from bottom up is by its very nature a child of the concepts at hand' (Neurath 1983: 3). Now, are we obliged to discard the idea of an independently existing world as a basic presupposition of the scientific enterprise itself simply because of the unintelligibility of its reference to a theoretically neutral world of unconceptualized structure, which may never become accessible to our thinking minds? The correct answer to this question is, I think, in the negative. If I am right, then coherence theory in the sense of Neurath, if not in the sense of Goodman, is one version of SR in which neither 'truth' nor truthlikeness in the sense of Popper plays any role. If, on the contrary, we are to make sense of Neurath's picture of science, we must recognize with him that science is *unique* in that *the* world to which it *becomes anchored*—Neurath's metaphor of the open sea—is the same unconceptualized world out of which different theories carve out their respective worlds. Contrary to what Goodman would like to say, *the* world of the scientific realist is not then 'on the whole a world well lost'. It very much stays with us as a basic presupposition of science. Neurath's enterprise is not, therefore, completely lost in Goodman's own enterprise concerning the *ways of the world making*. This will become clear, I think, if we allow the Putnam picture of science, recently proposed by him, to replace the Neurath picture, and the problems of demarcation and truth to disappear completely from the philosophical scene. For one normally understands these and similar problems concerning scientific rationality as a consequence of SR as an attempt to look at science in terms of features that are believed to be unique to this enterprise.

> My picture of our situation [Putnam declares] is not the famous Neurath picture of science as the enterprise of reconstructing a boat while the boat floats on the open ocean, but it is a modification of it. I would change Neurath's picture in two ways. First, I would put ethics, philosophy, in fact the whole culture in the boat, and not just 'science', for I believe all the parts of the culture are inter-dependent. And, second, my image is not of a single boat but of a *fleet* of boats. The people in each boat are trying to reconstruct their own boat without modifying it so much at any one time that the boat sinks, as in the Neurath image. In addition, people are passing supplies and tools from one boat to another and shouting advice and encouragement (or discouragement) to each other. Finally, people sometimes decide they do not like the boat they are in and move to a different boat altogether. (And sometimes a boat sinks or is abandoned). It is all a bit chaotic; but since it is a fleet, no one is ever totally out of signalling distance from all the other boats. We are not trapped in individual solipsistic hells (or need not be) but invited to engage in a truly human dialogue; one which combines collectivity with individual responsibility (Putnam 1981: 118).

IV

Is it possible to view science alternatively, so that the different approaches we have considered above are rendered largely irrelevant by shifting the priorities among the fundamental questions concerning it? The kind of new priorities I have in mind for developing a more dynamic realistic view of scientific progress may be indicated by the following ordering of these questions:

(*a*) What is (the epistemic-structural identity of) science?
(*b*) Does science progress and knowledge grow according to some universally rational pattern?
(*c*) What constrains our search for the best possible methodology of rational theory-choice in science?
(*d*) Does science have an aim which may be said to constrain this together with the scientist's search for the best possible theory in a particular field?

This already breaks with the long tradition of putting the question 'What does science aim at?' before every other question, and then constraining everything else by saying that science aims at truth; and that the more truthlike its theories are the more progressive they will be. What is presupposed or just taken for granted in this tradition is a dogmatic attitude to the structural identity of science. This is best expressed as the statement-view that the epistemic-structural identity of science lies in the system of its statements, which are capable of being either true or false. It is true that we find it invariably at work in the approaches of Popper, his followers—Goodman, Neurath and Putnam—as also in those of other philosophers. But sooner or later we should ask whether it is at all relevant to solving our problems of rational appraisal of scientific theories. If not, then we had better leave the problems of truth and truthlikeness to the care of the philosopher of language himself. If yes, then our real starting point should not be the statement-view itself, nor the idea that science aims at truth; but the larger question of the nature of such appraisal as a whole together with the structural-identity question concerning science. Otherwise, we have ourselves to bear the cost of indicating the unit of appraisal even before asking relevant questions concerning it in the light of a systematic conceptualization of the growth of scientific knowledge.

I believe that any attempt to make SR a dynamic philosophy of science will have to take into account two things:

(*i*) Those recent discussions[11] which have strongly tended either to undermine or to give an inductivistic turn to Popper's version of SR; and

(*ii*) Those recent developments in the field of scientific theory and experimentation which have encouraged scepticism concerning SR more recently.

This may explain why I consider it necessary to set new priorities for SR such that the questions of the structural identity (Pandit: 1983) of science receive the kind of attention they deserve. As I have argued elsewhere (Pandit: 1983) it is not something simple which the type-identical statements, capable of being true/false, can determine. On the contrary, it is codetermined by the type-distinct epistemic structures as abstract as *theories* and *problems* in mutual interaction. The realism of (our) scientific theories lies then, I suggest, not in any alleged commitment of science to one and only one true theory but elsewhere, viz. in their ability to give rise to and to share *problems* which serve as its best guide to experimentation in newer domains of subject-specific scientific interest. This amounts then to a version of SR, now in progress, which entails what I call the methodology of theory-problem interactive systems (Pandit 1983). What the methodology directs the philosopher of science to do is to look for important types of correlations between significant theory-problem interactions and scientific progress within the following broad framework: greater the *interaction* between (our) scientific theories and problems at the different levels of problem-determination, problem-formulation and problem-proliferation, greater are the chances for our knowledge as a whole to grow (Pandit 1983).

Notes

1. Where *explication* should be understood strictly in the technical sense of Carnap (1956) and Tarski himself.
2. Donald Davidson (1967: 304-23). Whatever be the detailed nature of those slices of the natural language which Davidson's programme may be said to have brought under the regimentation of a truly extensional semantics in Quine's sense, his programme should be evaluated *first* in the light of his two-fold claim (*i*) that what he expects a theory of meaning to do is to address itself to the semantic productivity of language; and (*ii*) that his approach is holistic in that he expects the theory to address itself to language as a whole—to its sentence-structures as wholes. *Secondly*, its evaluation cannot ignore Tarski's strong and cogent warnings against extending his techniques to the complexities of the ordinary natural language. *Lastly*, on a closer look, one might ask: how Davidsonian is Davidson's programme? For what it lacks is the basic unifying framework which characterizes every alternative philosophical programme of analysis. Picking up one bit from Wittgenstein, one bit from Tarski, one bit from Quine, one from Chomsky and yet another bit from ordinary language analysis school can hardly make a programme which is relatively self-sufficient. Is it not then more reductive than phenomenalistic and Tractarian reductionisms were at one time?
3. 'In fact, before I became acquainted with Tarski's theory of truth', recalls Popper (1972a: 223), 'it appeared to me safer to discuss the criterion of progress without getting too deeply involved in the highly controversial problem connected with the use of the word 'true" See also K.R. Popper (1972b: 319-21).
4. The liar paradox relates to the sentence: (*S*) *This sentence is false*. If we suppose that *S* is false, we have no option but to admit that it is true, since what it says is not the case: *S* is true *iff S* is false. For details, see Tarski (1956: 157-58) and Susan Haack (1978: 135-36).
5. 'Whoever wishes, in spite of all difficulties', argues Tarski (1956: 267), 'to pursue the semantics of colloquial language with the help of exact methods will be driven first to undertake the thankless task of a reform of this language. He will find it necessary to define its structure, to overcome the ambiguity of the terms which occur in it, and finally to split the language into a series of languages of greater and greater extent, each of which stands in the same relation to the next in which a formalized language stands to its metalanguage. It may, however, be doubted whether the language of everyday life, after being 'rationalized' in this way, would still preserve its naturalness and whether it would not rather take on the characteristic features of the formalized languages.'
6. According to A. Tarski (1956: 267): 'The concept of truth (as well as other semantical concepts) when applied to colloquial language in conjunction with the natural laws of logic leads inevitably to confusions and contradictions.'
7. Details are to be found in A. Tarski (1956: 210-14; 265).
8. If we look at empirical science from the point of view of Gödel's theorem of incompleteness, extension of Tarski's techniques to it becomes all the more doubtful. This may explain why Tarski (1944: 71) puts forth the following epistemological neutrality claim: '...we may remain naive realists or idealists, empiricists or metaphysicians.... The semantic conception is completely neutral toward all these issues'. Unless this is meant as an ideological neutrality, it is trivially entailed by the equivalence constraint built into the material adequacy condition: All truth-theories must entail instances of: (*T*) *S* is true iff *P*.
9. See K.R. Popper (1972a: 226). Notice how Popper compares the status of objective truth and its role as a regulative ideal with 'that of a mountain peak usually wrapped in clouds', always so elusive to the relentless climber in the very process of beckoning him to keep climbing till the summit is reached.
10. Carnap himself admits this. See Rudolf Carnap (1937: 321-22).
11. I have here in mind Miller (1974a, 1974b), Niiniluoto (1984) and Tichy (1974).

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Tributes to the memory of Pandit Badrinath Shukla

SOME REMINISCENCES

It was in the year 1976 that I had the good fortune of meeting Pandit Sri Badrinath Shuklaji. The Department of Sanskrit, Sri Venkateshwara University, Tirupati, had organized a fifteen-day 'All India Level Institute in Nyāya'. I was one of the participants. Sri E.R. Srikrishna Sharma, the then Professor and Head of the Department of Sanskrit, was the Director of the Institute. Veteran Naiyāyikas of the day, such as Vepattoor Subramhaya Shastri, V.S. Ramachandra Shastri, Damodara Pisharoti, N.S. Ramanuja Tatacharya, were invited to guide the participants. The most important topics in Nyāya such as *Prathamantarthamukhya Viseṣyaka Śabdabodhavāda, Pramāṇyavāda, Samavāyavāda* and *Ātmavāda* were prescribed for discussion. To tackle the problems in a methodical way a questionnaire, touching all the important points, was also prepared. In the first week, the scholars who guided the participants explained the issues excellently, and gave the insights of the subtle philosophical points.

It was in the second week that Pandit Sri Badrinath Suklaji came and guided the discussions. *Pramāṇyavāda* was under discussion. He intervened often and helped the discussion by making use of the Nyāya technique. The next topic for discussion was *Samavāya*. Nyāya holds a peculiar view of this concept which is criticized by almost all the other schools of philosophy. The discussion on it went on nearly for three days. Each and every point, however adverse it was from Nyāya point of view, was given threadbare discussion. All along the participants, most of whom were traditional young scholars, raised very pertinent questions. Sri Shuklaji was there to answer all of them. He never lost his composure. He never avoided the inconvenient questions. With an ingenuity of his own, he explained the subtle issues involved and helped others to understand them clearly. It was a rare experience for all and a memorable occasion.

After that I met Sri Suklaji in many seminars held in different parts of the country, such as Delhi, Pune, Sagar, Sarnath, etc., and it was Sri Shuklaji who was the main spirit behind their success.

The memories of the Śāstrartha Gostu jointly organized by ICPR and Rashtriya Sanskrit Samsthan at Sarnath are still afresh in our minds. Almost, all the prominent Naiyāyikas of the country participated in it. It was before that august assembly of scholars that Sri Shuklaji demonstrated that even a Naiyāyika of traditional school could think in a different manner. Here he presented a paper on *Dehātmavāda* in which, making use of all the Navya-Nyāya techniques, he argued that there was no need to accept the *ātman* which

was different from body. It is true that such views were held by the early Cārvākas in this country who were severely criticized by the other schools. Nevertheless, Sri Shuklaji's arguments were never stale. His arguments were purely in the style of a Naiyāyika, and were strikingly original. Whether Sri Shuklaji believed in what he argued was not relevant at the moment. But he showed for once, probably for the first time after Raghunātha Śiromoṇi, that a Naiyāyika could be a revolutionary and original as well in his thinking.

Again, before the seminar was concluded another incident took place in which Sri Shuklaji once again showed that he was a Naiyāyika to the core. A scholar who had specialized in Buddhist philosophy made an attempt to criticize some of the Nyāya doctrines. At first Sri Shuklaji tried to convince him of the logicality of the Nyāya stand. But the scholar, instead of noting the reasoning, continued to repeat the Buddhist stand. Sri Shuklaji hit back. Threadbare, he analysed the Buddhist stand and shattered it. He proclaimed: *akhaṇḍitam bauddha matam na tiṣṭet* (अखण्डितं बौद्धमतं न तिष्ठेत्). It was a rare treat to the lovers of the dialectics of Nyāya and Buddhism.

Being a South Indian, I must confess that my contacts with him were not so frequent. Yet, on a few occasions, in which I had some opportunities to observe him very closely, he left on me an indelible impression. Probably, he was the only traditional scholar who had realized that the Nyāya scholarship which had already reached a low point of standard would completely vanish from this country unless its subtlties were exposed to the modern minds. There is no doubt that it is only because of him that some of the leading Western-trained philosophers of this country have started taking interest in Nyāya philosophy.

Whenever a famous personality passes away, normally, almost mechanically, we use the expression 'a great loss to the country', etc., etc. But, in the case of Sri Shuklaji, I believe that these words are more than true.

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BADRINATHJI : SOME REMINISCENCES

Traduttore—traditore: a translator is a traitor. So runs the Latin adage. It was in my capacity of a translator that I first got to know Acharya Badrinathji at Pune in July 1983. For five days I had to translate the questions, explanations, interruptions and arguments issued in English by the philosophers trained in the Western tradition in my rough and ready, limping, inelegant Sanskrit for the benefit of the traditional Pandits headed by Badrinathji. But, more formidably, I had immediately to translate the Pandit's replies, refutations, counter-questions and sustained arguments back into English. Unlike Sri Nivas Shastriji of Pune who spoke slowly, articulately and perhaps deliberately descending down to our level, Badrinathji's words—the chiselled Sanskrit prose—poured out fast; and his ideas uncompromisingly profound and ingenious ran even faster. It was impossible to interrupt him. Since he knew enough English to detect any gross mis-representation, one had no scope of filling up gaps of comprehension by any hazy bit of imagination or rhetoric. He would tirelessly reiterate the steps of the argument, explain more lucidly, anticipate every possible confusion, and thus help the poor translator a lot. Yet, I constantly felt that I was betraying him. My loose, halting, guessing, oversimplifying English failed constantly to be faithful to his rigorously argued tight talk. So, apart from betraying him, in a different sense I *betrayed* my ignorance, my lack of training in the art of philosophical truth-searching.

Yet—and here was the true greatness of that ideal educator—I never felt too small or humiliated. Badrinathji was an intellectual giant, but unlike many contemporary towering traditional Indian Pandits would not smother honest questions or trample opposition. That way, he was a stalwart in the truly Nyāya tradition of *Vāda-kathā*, where you don't argue to demolish or to win but to find the truth.

In Pune we had been discussing Russell's theory of propositions, both the early and the later theories. The first two days Badrinathji along with other very competent Pandits, was mainly asking questions to be clear about the Western position or positions which, to start with, must have sounded pretty outlandish and odd in Naiyāyika ears. Early Russell's distinction between Being and Existence and the status of false propositions as objectively subsistent entities was difficult to stomach not because he was opposed to abstract entities as a Naiyāyika but because he thought he could *do without* such subsistent meanings of sentences or truth-bearers. Professor Daya Krishna, Prof. Pahi (who also spoke some Sanskrit) and Prof. Shibjiban Bhattacharya hammered the standard reasons for positing propositions. Prof. Rege produced convincing examples. Then, suddenly, Badrinathji seemed to see the point. On the third day he came out as a defender of Russell, and argued that we *do* need propositional contents if we have to give an account of *what* the philosophical debator *refutes* when he comprehends the opponent's position without accepting it as true. He almost *introduced* this new notion in Nyāya terminology into the Nyāya framework. As a translator I felt somewhat disappointed. Did he then succumb to the Russellian pressure? Was he giving up the Nyāya hard-headedness which refuses to admit any intervening third realm between words and things? In the evening, outside the meetings—by then we had become best of friends—an unequal friendship that was to last till the unexpected end of his life—he told me in Sanskrit: 'I have established your Russell today properly in our own terms, so that, now, tomorrow I can refute him.' He kept his promise. The whole exercise is now on record, first in his own historic Sanskrit paper on Russell's notion of propositions and other issues in philosophical logic (I think the first original essay *in Sanskrit* on contemporary philosophical topics), and

then in the transcript of the Pune proceedings painstakingly prepared by Prof. Rege and others over the years which is soon expected to be published.

He was the seniormost and most eminent scholar in these meetings, the Pune one being followed by further sessions in Delhi, Vārānasi, Tirupati and Srinagar; and I was the juniormost and most little-known one. Yet his affection and pampering made me feel as if I was born to learn from him and had a right to demand his patience and paternal warmth.

Two tiny examples of his quick wit will not be out of place here. At one point some other orthodox Sanskrit-speaking scholar asked him: 'What you say is quite strikingly novel, but *is* it the Nyāya view?' And pat came the answer in chaste Sanskrit: 'I am a Naiyāyika, and it is my view, hence it is a Nyāya view.'

At another point, the Western philosophical problem of induction was being explained to him. No universal generalization can be conclusively proved. (Is there any recognition of this problem in Indian logic?) Instead of answering it directly he asked innocently: 'How do you mean *this* negative statement? As a universal generalization or not? If *this* is universal, it can't be conclusively established. So, the counter-example, i.e. some conclusively provable universal generalization, might exist?' Then he laughed and said: 'I feel there is a genuine problem, but I just threw some dust in your eyes to get some time to think over it.'

In Vārānasi (1985) he shook the smugness of the complacent expositions of the classical Nyāya theory of soul-substance by arguing in elaborate details that all the ontological purposes, which are served by the *ātman* (soul) in the Nyāya framework, could be served by the body and the *manas* (internal sense organ), so that the self as a ninth substance falls away as redundant. Towards the end of his closely argued paper which propounds a physicalism—carefully distinguished from the Cārvāka materialism—Badrinathji fearlessly voiced the (not uncommon) feeling that if, instead of being assured of a relaxed eternity, the human individual is goaded by the philosophical warning of this bodily existence being the only *one* change given to him, his moral hurry to proceed to perfection will be even more urgent. Hence the ethical salutariness of physicalism as against the dualistic theory of immortality of the soul.

I remember the constant (sometimes flippant but never unserious on *his* part) philosophical chat we had while standing in a queue in front of the Bālāji temple on top of the Tirupati Venkatachal hill. Some of Badrinathji's own disciples were trying to poke holes in his Nyāya theory of *body-self identity* (he preferred this shocking title, for he meant it as a proposed *emendation* of the Nyāya position rather than a refutation of it). I was approvingly repeating those arguments while he was cracking jokes with another group of people. He could overhear and snapped at us quickly with a solid answer to our attack. He told me that he would wait for five years for a reply from any competent defender of the classical Nyāya dualism. If none comes forward,

he will himself show how such a physicalism will turn out to be inconsistent with more basic Nyāya presuppositions about the categories like substance, quality, action, inference, etc. His challenge yet remains unmet. In the true Indian philosophical spirit, he built up a *Pūrva Pakṣa* with more care than even a committed materialist would do it. When you are making academic schemes, i.e. plan in the area of knowledge and learning, says the well-known Sanskrit moral maxim, think of yourself as ageless and deathless (*ajarāmaravat*).

When I last saw him at his own home in Vārānasi in August 1987, his health had totally broken down. Sustained talking was beyond his capacity, but sustained *thought* was still his prerogative. We were discussing our old favourite topic: must we somehow *believe* that *p* is the case to understand correctly someone's statement to the effect that *p* is the case? He had promised to contribute a core-paper in a volume on 'Knowing from Words' that we were planning to bring out on the Indian and Western theories of knowledge by testimony and theories of meaning and interpretation. He never suggested that he might not be able to write another paper.

At Srinagar in 1986 we gathered together to discuss what is living and what is dead in Kashmir Shaivism. I used to cook for Badrinathji. He had severe bouts of coughing and a bad shivering kind of fever. Yet, while I cooked, the eighty-year old 'Scholar Extraordinary' would entertain me by Sanskrit poems, ranging from the sublimest, though romantic, to the most hilarious ones. He loved to listen to music, and always asked me to sing this or that bhajan for him. His innovative mind made characteristic contributions even in his musical taste. He wanted me to devise new *Tālas* (rhythm-cycles or beats to sing to) after the longer Sanskrit metres. His special favourite was the verse-rhythm called *Śikhariṇi* (शिखरिणि) which is a seventeen-lettered rhythe-scheme. He tried to make it into a musical rhythm. It was amazingly refreshing to listen to romantic poetry recited by this orthodox aged Pandit steeped in the driest of disciplines—the Navya-Nyāya.

In spite of being a committed Naiyāyika, Badrinathji propounded that *mokṣa* could not consist in a sheer privation of suffering. It must have been intended by Gautama himself as a positive state of bliss.* He had arguments for interpreting the Nyāya *sūtras* in that line, challenging, when needed, even Vātsyāyana, the commentator. Given his zest for life, his undying thirst for freshness and his ever-youthful enthusiasm to learn from other traditions and newer generations, he must be very impatient to be reborn to finish the numerous unfinished projects he has left behind, unless, of course, he unwittingly hit the *truth* while arguing, tongue-in cheek, that there is no *rebirth*. There is one other possibility. He might have attained the positively joyful

*He would hasten to distinguish his position from that of Bhāsaḥvajña who was famous for introducing *Ānandamokṣavāda* in Nyāya metaphysics, introducing characteristic niceties in his reasonings.

state of liberation, the conception of which he was busy in justifying philosophically.

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PANDIT BADRINATH SHUKLA: SOME REMINISCENCES

I first met Pandit Badrinath Shukla when he came to the University of Rajasthan to deliver a series of lectures in the Department of Philosophy. Everyone was very much excited by the presence of this learned scholar who not only knew the answers to all the questions but could even grasp the question hardly before the words came out of the mouth. Shuklaji never said that the question was not in the texts; he never quoted what others had said, but formulated his answers on the basis of his own thought; and it was clear that his thought had led him far outside the confines of the Nyāya orthodoxy. So, when Daya brought him home to bask for a while in the winter sun in our garden, I was quite overawed. Lean, yet graceful, his figure was as imposing as his mind. And, to my surprise, he was not reserved but warm and affectionate with the capacity to reach out immediately to others. And what a hearty laugh! In fact, as I later became more familiar with the pandits, I found them fun-loving and full of jokes.

My interest in the traditional scholars has not been so much in their learning as it is for the most part a closed world to me as I do not know Sanskrit. But I have always been led to wonder about their milieu. What were the traditional *pāthaśālās* like? What was the course of study, the curriculum? Who attended them? Of course, I was later to learn that it was different for the scholars in the South than it was in the North. And so I used to ply Shuklaji with all kinds of questions. He must have been amused, but nevertheless he was very patient. He told me he had been taught as a young boy growing up in eastern UP all the branches of traditional learning: the Vedas, the Dharmaśāstras, the Sāhitya, traditional mathematics and medicine and even Jyotiṣ (astronomy), so that the traditional sciences were also included. A well-rounded curriculum indeed! Then later he began his studies with a pandit who specialized in Nyāya.

The second time we met was in Pune when Prof. M.P. Rege held the very first of the series of the 'Dialogues with Pandits'. Shuklaji had brought with him another scholar and also a young *celā* who used to cook as well, and I remember the pungent smell of the red pepper in the frying pan before the vegetables were added and the aroma of *dāl* while discussions on philosophy went on and on in the hours of the morning before the sessions started. Later, they would continue during the long evening walks.

In the seminar it became obvious at once that Shuklaji was the master of

the game, though the other pandits were also very learned, specially the good-natured Pandit Srinivas Sastri of Pune and the great grammarian Pandit Peri Surya Narain Sastri of Andhra. But Shuklaji was remarkable in the way he could grasp the questions that had been formulated for the seminar, issues that had been raised by Russell, Wittgenstein and Frege which had been translated into Sanskrit and given ahead of time to the pandits. One of the main problems was the nature of the proposition—none of the traditional scholars could understand the necessity for it. Then, of course, the question arose as to what, if anything, was used as a counterpart in Nyāya. It was amusing to hear the pandits pronouncing Russell as 'Russala', so that Russell almost seemed to have become a member of the Nyāya canon.

Later, I asked Shuklaji if any of the questions that were raised by the Western logicians had also been discussed in the Nyāya tradition. He replied that many of the issues had already been raised by the seventeenth century in India. Then, when I asked if he felt that Nyāya was a living tradition, he vigorously argued that it was very much alive, and that he himself had been working and thinking along new lines that were yet in the Nyāya framework.

When we gathered together in Srinagar for the seminar on 'Kashmir Shaivism', little did any of us know that it would be our last meeting with Shuklaji. It was his first visit to the valley and he seemed to enjoy the new landscape, the delicious apples fresh from the trees, the scent of pines and the cool air. His response was almost childlike—everything was new: the shikara ride to the houseboat, the water birds, the special sweets from the town. He made us all love to serve him.

One of the sessions was held in Gulmarg, and the drive through the valley and the stops at the mountain streams gave him great pleasure. We have photos of the session in Gulmarg in the meadow of flowers with the blue-grey hills surrounding the valley. There he is, presiding over the group like a wise Indian Prospero, towering over everyone, intent on his ideas, but making the mental work full of fun and enjoyment, while the rest of us sat at his feet.

The passing away of Shuklaji is a great loss. Not just because of his personality, not just because of his great learning, but because of his freedom of spirit reflected in the intrepid way he could respond to something new and yet make it organically part of his own and in turn part of the tradition itself. In him the tradition was rendered alive.

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NYĀYA-DĪPA: THE LAMP OF LOGIC IS EXTINGUISHED

Kāśī is a unique seat of traditional Sanskrit learning in India. For centuries it has drawn pandits from all parts of the country making it a cosmopolitan city

for various *Śāstric* disciplines, more particularly the Navya-Vyākaraṇa (Neo-Grammar), Navya-Nyāya (Neo-Logic), Vedānta of Śaṅkara and Sāhitya Śāstra which are far more complex and profound in intellectual structure than their old forms as they follow the Navya-Nyāya technique which aims at minute perfection of concepts and precision of expression. Pandits from Bengal and Mithila ruled Navya-Nyāya learning at the turn of this century in Vārānasī. Pandit Bal Krishna Mishra, a Maithili at Sanskrit College (now the Faculty of Sanskrit and Theology) of Benaras Hindu University, was the eminent Neo-Naiyāyika under whose care Pandit Badrinath Shukla grew as a wrestling Naiyāyika in his youth and gradually outshone all others in the field. This secured for him an initial appointment in the Sanskrit College, Benaras Hindu University, and later on the most prestigious Professorship of Nyāya at Government Sanskrit College (constituted now as the Sampurnanand Sanskrit University), Vārānasī.

It was here in the summer of 1954 that I had some lessons in *Nyāya-siddhānta-Muktāvali* from him. His exposition of the benedictory verses of this text stupefied me, because he conveyed not merely the primary sense of the text but led me into the complicated world of Navya-Nyāya through these seemingly simple verses in Sanskrit. But this was, and is, the speciality of traditional Sanskrit learning in India. A master of the *Śāstras* can impregnate a simple word, phrase or sentence with all the possible meanings implicit in it, and make it a springboard for more and more complex and abstract meaning and thought. Badrinathji possessed this quality in an extraordinary degree. He used it both positively and negatively to establish his own position and demolish the counter-positions of others. In fact, this skill is the hallmark of an eminent teacher also. Hence the dictum *Vyākhyā-Buddhibalāpekṣā*. The elucidation depends on a sharp intellect. This kind of instruction was glorified in the sanctified temples of Sanskrit learning in Kāśī. No other scholar or teacher was a match for Shuklaji in this respect. He popularized the learning of Nyāya and Vedānta and, raised the standard of studies in these subjects by his brilliant exposition even of such popular texts as the *Tarkabhāṣā* and the *Vedāntasāra*.

However, this, by itself, is not enough to earn outstanding eminence in the world of Sanskrit learning. Success in *Śāstrārtha* (intellectual encounter on a technical subject of a *Śāstra*) with equals or more than equals is also required to establish one's unrivalled position in the extremely demanding community of traditional scholars in the field. This requires not merely a mastery over the details of the discipline but also a razor-sharp intellect which can immediately perceive fallacies in the arguments of the opponent and can formulate new issues and problems to defeat apparently strong and formidable positions. Shuklaji was known for his eminence and success in such *Śāstrārthas*.

The same intellectual supremacy was successfully demonstrated when, in the assembly of the Naiyāyikas gathered in a seminar organized by Prof. Daya Krishna at Sarnath, he propounded his theory of the body being the

soul following the technique and principles of Navya-Nyāya. None of the pandits assembled there could successfully challenge his arguments which he had built up without violating the tradition of Nyāya. His supremacy in Navya-Nyāya and his penetrating, sharp intellect were well known and adored by his students and admirers. But a relatively unknown and interesting facet of his intellectual personality was not known to many and certainly not to me. Perhaps it was only revealed through the new experiment which Prof. Daya Krishna carried out by bringing together pandits well-versed in traditional *Śāstric* disciplines and modern intellectuals trained in Western modes of knowledge. Seminars organized at Poona, Delhi, Sarnath, Srinagar and some other places discussed current theories, posed new issues and challenged the tradition to respond to them effectively. Pandits, the intellectual repositories of the traditional knowledge of India, were generally never invited to the seminars held in the universities and institutions of higher learning in the country. Rather, they were treated as if they were deaf and dumb, for they could not hear or speak the language of Westcentric scholars who rule the intellectual world of India. Prof. Daya Krishna's experiment provided a common platform for traditional and modern (for want of a better world) scholars by providing the facility of on-going translation and thus devising the possibility of a living dialogue between them. Shuklaji played a leading role in all these seminars by first understanding the new concepts with full sympathy, then analysing them in his own intellectual context and finally modifying the old formulations in the light of new facts and interpretations. This heralded new developments in Indian thought, and deepened our understanding of Western concepts in logic, philosophy and linguistics.

The great adventure in search of universal knowledge met its first setback in the passing away of Shuklaji who remained responsive to hard-core philosophy and uncompromising rationality till he breathed his last. It was he who could minutely analyse the new concepts, compare them with the kindred concepts of his tradition, and be bold enough to accept change and modification in traditionally recognized thoughts and modes if he was convinced of the validity and rationality of the new philosophical perception. Nyāya is a lamp of all disciplines: *pradīpaḥ sarva-vidyānām*. Its greatest votary in our times is no more with us. Let his published works on Nyāya, Vedānta, Jainism and the Purāṇa light our path.

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MY FIRST MEETING WITH BADRINATHJI

Badrinathji had come to Jaipur to deliver some lectures on *anumāna* in Navya-Nyāya when I first saw him and heard him. His exposition of this very complicated subject was clear and interest-arousing even for those, such as

me, uninitiated in the mysteries of Navya-Nyāya. What was most remarkable was the manner in which he answered questions. He could get the point of a question even before it was fully enunciated and properly articulated. Perhaps this was because of his Navya-Nyāya training where the very method of exposition proceeds through questionings and objections. This comes out even in his small essay on *Dehātmavāda* which I have translated, and which is published in this issue of *JICPR*.

I was asked to take him and his wife out and show them around Jaipur. Badrinathji was not interested in the places of 'tourist interest'—the museums, the forts, the city-palace. For him and for most Indians, Jaipur is not really a tourist town in this sense. It is a *Tīrthasthāna*, the major place of interest being Galtā, the site of Gālava Muni's *Āśram* and perhaps the only Sūrya temple now in worship. Badrinathji, however, was even more interested in visiting Govinddevaji's temple, one of the most revered and popular *gauḍīya* temples of Jaipur, which, since Jaisingh who built the town, is quite a *gauḍīya* place. Jaisingh was himself a *gauḍīya*. Badrinathji was very moved at the sight of the beautiful Kṛṣṇa image at the temple. He said he was a *bhakta* at heart and sometimes, like Caitanya, felt that Navya-Nyāya was nothing but a dry intellectual exercise—not satisfying for the soul. But moved he may have been by *bhakti*—few Indian's are not—yet Badrinathji was an intellectual at heart and keenly *enjoyed* a good intellectual question.

I had asked him one. It was a question which had been bothering me for a long time since I was a student of M.A. years ago. The question concerned a famous *sūtra* in the *Nāṭyaśāstra*, of Bharata: *vibhāva*, *anubhāva* and *sañcāri bhāvas* together give rise to *rasa*, says Bharata in this *sūtra*. *Vibhāvas* refer to characters and situations on the stage, *anubhāvas* to actors and actresses and *sañcārīs* to various sentiments and emotions. This *sūtra* has been considered the basic *sūtra* for understanding the process of *rasa*-arousal in Indian aesthetics and is said to apply to all art experience including music. This had been bothering me since I was introduced to *Rasaśāstra* as a student of M.A. I had also been a student of music since a much earlier age. How could this *sūtra*, I had asked myself, apply to music, since music was neither *vibhāvas* or *anubhāvas*? I had some good teachers in M.A. who were very well versed in the texts on *rasa*. I had put my question to them too. It was, it seemed to me, a simple question which could be simply answered. But my teachers and some others to whom I put the question failed to see it as a simple question. They were too bogged down by the weight of the tradition which had elevated Bharata's *sūtra* into a great and fundamental aesthetic principle. They were puzzled, but they thought that the tradition must have an answer to the question. They were trained in the tradition, but they worked at the tradition as a thing of the past. They revered it from a distance. There were one or two 'moderns' among my teachers—with one whom I registered as a Ph.D. student in order to work on this very question—who were much more open to this question; but for them, too, the interest in the question was a purely impersonal *historical* matter, which, they thought, concerned a tradition dead, bygone and irrelevant to modern art and thought. To me the question seemed a living question, a question which bothered me here and now.

When I put the question to Badrinathji, his reaction was very satisfying for me. He could see the point immediately. He, too, had studied the theories of *rasa*, for they are part of the curriculum of any good Indian Pandit, and he, too, was taught that the *Śāstra's sūtra* was the key to understanding all the arts, including music. But it was easy for him to question the tradition: he was at home in it and felt free with it. For him it was not a thing of the past. It was a living thing which provided a structure for his own thought. But these structures were not immobile or sacrosanct. They could be questioned and transformed. The Navya-Nyāya training had, indeed, sharpened his mind in seeing questions and also in assessing definitions such as the one which Bharata's *sūtra* offers. He could at once see that Bharata's definition cannot be made to extend to music, if music has no *vibhāvas* and *anubhāvas*.

Later in a Pune seminar, where both Indian and Western-trained philosophers had gathered to discuss Russell's theory of propositions, I saw Badrinathji's brilliance and philosophical acumen in handling not only traditional, but even modern questions with a sharp and open mind. He was one of those persons who make us wonder whether the categories 'modern' and 'traditional' are really meaningful.

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Notes and discussions

COULD SOMEONE ELSE HAVE HAD MY HEADACHE?

Philosophers generally agree that a sensation necessarily belongs to the particular consciousness that is its subject. We may call this 'The Thesis of Essential Ownership': sensations in different possible worlds are identical only if they have the same subject. My headache could not have belonged to someone else; at best another man would have had a different headache identically similar to mine. In this paper, I will argue that the Thesis of Essential Ownership is false. The truth is that sensations belong to their subjects contingently. Another way of putting my thesis is that it is not a part of the identity condition for a sensation that the sensation belongs to any particular subject. Of course, the Thesis of Essential Ownership is deeply embedded in philosophical thought; it seems so plainly self-evident to so many people that I do not think I can refute it outright. I will be content to show it is very doubtful.

My strategy is three-fold. First, I will give a counter-instance to the Thesis of Essential Ownership, a case in which it is plausible to say that a particular sensation has different subjects in different possible worlds. This example suggests a new account of the sufficient condition of identity for sensations. The second part of my strategy is to argue that this new account is a better and more plausible theory than the Thesis of Essential Ownership with which it is incompatible. Thirdly, I will show how the new account can be extended to mental representations too.

I

Suppose the hemispheres of my brain are anatomical and functional duplicates, realizing identically similar brain states and containing the same information. Suppose they are connected by thousands of nerves which transmit millions of impulses between the hemispheres each second and keep them synchronized. This entire system of hemispheres and connections functions as a unity. The anatomical fact that there are two hemispheres is a functional irrelevancy: there might as well be one hemisphere twice the size. Nonetheless, if one hemisphere is destroyed, I would go on just the same.

Suppose we transplant my whole brain to another body identically similar to mine; surely this would be me. But I can survive with one hemisphere. As Derek Parfit observes, it follows that if one, hemisphere is transplanted and the other destroyed, I survive in the new body.* Suppose this happens. When I awaken in my new body, my first sensation is a headache—call it *E*.

*Derek Parfit, *Reasons and Persons*, Clarendon Press, 1984, p. 261. Parfit's discussion of fissioning inspired this paper.

Now imagine another possible world exactly like the first *except* that the other hemisphere, instead of being destroyed, is spirited off to Venus and transplanted into a body there. Suppose this is done in a way that makes no difference to causal processes happening on the home planet (Earth). In this case, I fission into offshoots, and it seems plain that I cease to exist: one can not be two. *Each* of these fellows cannot be me, for then (by the transitivity of identity) they are each other which is manifestly false: soon they will have different memories and personalities on account of their different environments. Further, I can't be just *one* of them, for any claim one of them has to be me is matched, hence cancelled by that of the other. If we say that I survive with a divided mind and body, then we shall have to count three people when both offshoots come in the room (for each offshoot is a person in his own right) and give them three votes in elections (who will cast it?). As I can survive the loss of half my brain, if one offshoot dies, the other will constitute two people, himself and me. Finally, if we insist that there were two people in my body all along, one for each hemisphere (so that 'I' fails to refer), we discount the fact that the brain was a functional unity. We shall have to insist that there were two different people with identically similar mental states from the beginning, this extraordinary synchronism being explained by the fact that their nervous systems were physically and functionally entwined so as to ensure it, and both of them were embodied in and operating the same body from the first. But this is to describe one person. Surely, the most plausible description is that I cease to exist when I fission: a substance cannot survive fissioning into duplicate substances.

What follows is this: if one hemisphere is transplanted and the other destroyed, I survive in the new body (call this World I). But if *both* hemispheres are transplanted, I cease to exist and the fellow who awakens in the body on earth is not me (call this World 2). By hypothesis the causal processes on Earth are identical in both scenarios; therefore, this new person will immediately experience a headache. I submit that this headache is *E* the self-same headache *I* would have experienced if the second hemisphere had been destroyed. This headache has the same phenomenal properties as *E,* and it is caused or realized by the same brain state and in the same way. Surely, a sufficient condition for the identity of sensations in different worlds is that they are phenomenally identical, that the worlds are nomologically identical and that the sensations are produced by the same causal chain. It follows that *E* belongs to me in World *I contingently:* if the second hemisphere had been transplanted, *E* would have belonged to someone else. To deny this, the defender of the Thesis of Essential Ownership must insist that phenomenally identical sensations produced by the same causal chain are not identical in *just* those cases in which they belong to different subjects: then they are merely like each other. But this response is wholly *ad hoc,* and it assumes exactly what is in question: that one sensation cannot belong to two people. Now, *E* is an ordinary headache, a sensation with the same identity conditions as other sensations, not a different kind of thing. It follows that no sensation belongs to its subject essentially.

II

A sufficient condition for the identity of sensations is that they are phenomenally identical, and, further, that they are produced by the same particular causes governed by the same causal laws. The counter-example suggests that there can be cases in which a particular causal path (and the neural equipment in which it is embedded) *could* have belonged to a different subject; here event identity and personal identity diverge. Supposing there are cases in which it is impossible that a particular causal path could have belonged to a different subject so that the sensation belongs to the same subject in every possible world in which it exists, still the identity of the sensation is *explained* by the identity of the particular causal path, not the identity of the subject. These sensations are identical, *because* they are produced by the same causes according to the same laws, not because they have the same subject.

The theory that phenomenally identical sensations are identical when they are produced by the same particular causes according to the same laws is a more plausible theory than the Thesis of Essential Ownership. The old theory involves a notoriously difficult ontology of *subjects.* What exactly are these subjects and in what relation do they stand to bodies, brains, and mental events? Are they immaterial substances, Cartesian egos? Then they are queer entities. Are subjects *reducible* to bodies, brains, and psychophysical events, so that talk of subjects is really a talk of these other things? Then, subjects *qua* subjects can do no explanatory work. The new theory avoids these difficulties by omitting all reference to subjects. It involves a less problematic ontology.

Even if we make sense of an ontology of subjects, plainly most events in nature have none. The new theory has the advantage that it treats sensations, to that they are far less likely to be exceptions to a general theory of event identity. Donald Davidson maintains that events are identical just in case they have the same causes and effects.[2] This plausible theory does not mention subjects. However, I believe Davidson's criterion is contingently true at best, for it is possible than one cause produces *two* events with the same causal powers. For example, suppose that a particular brain state produces two sensations—a ringing in the ears and a sensation of warmth. Further, suppose that epiphenomenalism is true: mental events have no causal efficacy. The brain state does the causal work, not the sensations it produces. A consequence of Davidson's criterion is that these sensations are identical. Or suppose a particular cause produces two physical events which *would* have different effects except that God wills that the universe cease to exist. These have the same cause as well as the same effect—the null set. This suggests that an account of a sufficient condition for event identity cannot depend solely

*Donald Davidson, *Essays on Actions and Events*, Clarendon Press, 1980, p. 179.

on the condition that the events stand in the same relations to other events: they must share the relevant non-relational properties too. The new theory of the identity conditions for sensations may be a model for (as well as an instance of) a general theory of the identity conditions for events.

III

Can the new theory be extended to mental representations as well as sensations? We might say that token mental representations are identical when they have the same intentional content, and, further, they are produced by the same causal chain according to the same laws. Suppose that after the transplant in World 1 it occurs to me that water is wet. A consequence of the extended theory is that this token event could have belonged to someone else. If the second hemisphere had been transplanted, the thought of the other fellow in the new body on earth would have had the same content as mine, and it would be produced by the same causal chain according to the same laws.

But suppose that after the transplant I think that I have a headache. Plainly, the fellow in World 2 thinks that *he* has a headache, not that I have one. Our thoughts are about different subjects, they have different truth conditions, hence they are numerically distinct. If a particular causal chain can belong to different people, the resulting representations are bound to express different propositions when they are about their subjects. The thoughts in World 1 and World 2 have different intentionality, even though they are produced by the same causal chain in nomologically identical worlds; hence they are not identical.

This, again, suggests that an account of a sufficient condition for event identity cannot depend solely on the condition that the events stand in the same relation to other events. The extended theory does not entail that the thoughts in World 1 and World 2 are identical, because it adds the condition that the representations have the same intentionality to the condition that they are produced by the same causal chain. A consequence of the extended theory is that all the thoughts I have in World 1 after the transplant could have belonged to someone else, *except* those thoughts which could not belong to another subject without changing their intentionality.

To conclude: the counter-instance does not compel us to renounce the Thesis of Essential Ownership. We can insist the headaches in Worlds 1 and 2 are different sensations, or insist that I somehow survive fissioning. Nonetheless, the counter-instance shows that it is neither absurd nor implausible to describe these worlds as containing a sensation that belongs to different people. This description is a theoretical option. But, then, it is an option we ought to take, for the theory of identity implicit in the description is simpler, leaner, more general, and more fruitful than its rival. Indeed, we ought to accept the theory, even if we reject the counter-example (but then why reject it?). Sensations are identical, because they have the same phenomenal properties and are produced by the same causes, not because they belong to the same subject. You can have my headache whenever you like.

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COPI'S CONDITIONAL PROBABILITY PROBLEM

The following is the problem posed by Copi:[1]

> Remove all cards except aces and kings from a deck, so that only eight cards remain, of which four are aces and four are kings. From this abbreviated deck, deal two cards to a friend. If he looks at his cards and announces (truthfully) that his hand contains an ace, what is the probability that both his cards are aces? If he announces instead that one of his cards is the ace of spades, what is the probability then that both his cards are aces? (These two probabilities are not the same!).

Arguments and counterarguments have appeared in this connection. We intend to point out that almost all of these arguments, particularly that of Faber,[2] are relevant and correct provided the explicatum is subjected to their own interpretation of the said problem. Also, since, as Faber[3] has correctly said, 'the problem as Copi states it is indeterminate because the probabilities we are asked to calculate depend upon the (unspecified) rules under which Copi's game is played', the correctness of one's playing Copi's game will always be formally attestable, and consequently finding the so-called correct interpretation of Copi's problem would remain a formal game only. Hence any counterargument as such, presuming the determinateness of Copi's problem, appears *prima facie* unfair. For instance, Goldberg:[4] 'Unfortunately these articles are flawed by faulty reasoning as well as incorrect assertions and solutions'; Dale[5]: 'But this is not the question posed by Copi..' Feller:[6] 'But Dale, like Rose, incorrectly gives..'. Of course, we are not saying that even irrelevant and correct (formally) or relevant and incorrect arguments would work and should go without counterattacks.

In order to discuss almost all published and possible (as far as we can see) interpretations of Copi's problem, we present herewith the following schematic analysis:

Assume

E = 'both cards are aces'

A = 'one of them is an ace'

AF_i = 'the ith card is an ace', i—(1, 2)
(we choose to connote this as 'place reference')

AF = 'one of them is an ace (without place reference)
G = 'at least one of them is an ace'
(The phrase 'at least one' avoids place reference implicitly).
B = 'one of them is an ace of spaces'.
BF_1 = 'one of them is an ace of spaces (with place reference.)
BF = 'one of them is an ace of spades (without place reference)'
BG = 'at least one of them is an ace of spades'

Now, by enumerating cases[7], we have the following two groups of results:

1. $P(E/BG) = P(E/BF) = P(E/BF_1 = P(E/B) = 3/7$
2. $P(E/G) = P(E/AF) = 3/11$;
   $P(E/AF_1) = 3/7$

Observations:

(*a*) $P(E/A)$ is indeterminate because A could be AF as well as AF_1. Hence the two announcements (events) A and G need not be equivalent. This is in conformity with linguistic construal as well as epistemological requirements.

(*b*) As $P(E/B) = P(E/AF_1)$, the mention of a suit is equivalent to the mention of place reference. Thus, Dale's exception[8] to Rose's assertion that we are intuitively aware that 'the mentioning of a suit should not affect the probability' is partially tenable. Rose was correct if he meant $A = AF_1$. Faber's argument[9] which takes him to support Rose on this point is correct, and Goldberg's remark is not in order.

(*c*) Dale's objection[10] to Rose's statement 'the order of the cards within each hand is irrelevant and should be disregarded' is partially correct. For, all our results in (1) and (2) and consequences thereby are independent of order being taken into account in construction of sample space. That is, it is immaterial whether the sample space comprising the various possible hands containing aces consists of fourty-four hands (order being accounted for) or twenty-two hands (order disregarded). So Rose is right. But consideration of order within each hand plays decisive role afterwards in calculating the probability of E given AFi, and Rose himself has resorted to this interpretation for claiming that $P(E/A) = P(E/B) = 3/7$. So, Dale is right. Further, Dale's quoting of Feller[11] and Uspenski[12] is quite relevant in justifying A as AF_1 also.

(*d*) All our conclusions have been verified for the case wherein a hand of three cards or four cards is dealt out of the abbreviated deck containing eight cards, viz. four aces and four kings. For example,

1. $P(E/BG) = P(E/BF) = P(E/BF_1) = P(E/B) = 1/7$
2. $P(E/G) = P(E/AF) = 1/13$
   $P(E/AF_1) = 1/7$

where E = 'all three cards are aces', $i = (1,2,3)$, and all other things remaining as they are.

NOTES

1. I.M. Copi, *Introduction to Logic*, New York: Macmillan, 1968.
2. R.J. Faber, 'Re-encountering a Counter-intuitive Probability in *Philosophy of Science*, 43, 1976, pp. 283-85.
3. *Ibid.*, 283.
4. Samuel Goldberg, 'Copi's Conditional Probability Problem' in *Philosophy of Science*, 43, 1976, pp. 286-89.
5. A.I. Dale, 'On a Problem in Conditional Probability' in *Philosophy of Science*, 41, 1974, pp. 204-06.
6. W. Feller, *An Introduction to Probability Theory and Its Applications*, New York: Wiley, 1957, p. 283.
7. A.I. Dale, 'On a Problem in Conditional Probability' in *Philosophy of Science*, 41, 1974, p. 205.
8. *Ibid.*, p. 204.
9. R.J. Faber, 'Re-Encountering in a Counter-intuitive Probability' in *Philosophy of Science*, 43, 1976, p. 284.
10. A.I. Dale, 'On a Problem in Conditional Probability in *Philosophy of Science*, 41, 1974, p. 204.
11. W. Feller, *An Introduction to Probability Theory and Its Applications*, New York: Wiley, 1957.
12. J.V. Uspensky, *An Introduction to Mathematical Probability*, New York: Mc-Graw Hill, 1937.

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THE OBJECTIVITY OF MORAL VALUES : THE SEARCH IN A WRONG PLACE

If values were not objective, everybody would be free to choose his or her own system of values, and there would be an end to a rational discussion on them. Thus, a denial of the objectivity of values is subversive of an orderly progress of society, and is a theory obviously distasteful to us. On the other hand, hard objective facts, discovered in science and mathematics, as also the common-sense view of the world are acceptable to us; because some of these facts are perceived by our sense-organs, and the rest are conjectured by well-established logical and methodological procedures and are subject to inter-subjective tests and checks. No way has yet been found to apply these procedures and tests for the discovery of values. We could not have discovered the facts of common sense and science, if we did not have eyes to see or ears to hear. We could not have discovered logical and mathematical systems, if we did not have reason. What faculty do we have to discover the values? We may all desparately yearn for a set of objective values. But how do we go about discovering what they are, and how do we manage to ensure their near-universal acceptance through rational as against psychological, sociological or coercive procedures?

In his book *Ethics: Inventing Right and Wrong* (Penguin Books, London, 1977), J.L. Mackie argues that there are no objective values, i.e. values are not 'part of the fabric of the world' (p. 15). There is, of course, the activity of valuing or of thinking as right or wrong, or there is, of course, the subjective concern for things. But there is nothing in the world which backs up or validates some of this subjective concern (p. 22).

The argument which Mackie advances in favour of this view is that, if there were objective values, 'they would be entities or qualities or relations of a very strange sort, utterly different from anything else in the universe' (p. 38). The metaphysical peculiarity of the supposed objective values is that 'they would have to be intrinsically action-guiding and motivating' (p. 49). 'If there were objective principles of right and wrong any wrong course of action would have not-to-be-doneness built into it' (p. 40). Again, from the epistemological point of view, the objectivist view of values is in the end committed to the postulation of a faculty of moral intuition, which is utterly different from our ordinary ways of knowing everything else (p. 38).

If values do not form part of the fabric of the universe, this does not mean that we should desist from the activity of valuing. Since values cannot be discovered, they have to be invented. There are pressing problems facing man which can be solved only through morality. Morality is a sphere of evaluation, a kind of appraisal of human conduct which has a distinctive point. In his book, *The Object of Morality* (London, 1971), G.J. Warnock explains at some length what morality is supposed to bring about. He argues that things are liable to go very badly for human beings on account of various limitations—limited resources, limited information, limited intelligence, limited rationality, and above all limited sympathies. 'The function of morality is primarily to counteract this limitation of men's sympathies' (*Ethics*, p. 108). It has been debated whether the content of morality consists of a set of rules or a set of virtues. Mackie argues that both are needed. Hume argues that promising is a device, which enables people whose motives are mainly selfish to give each other reciprocal non-simultaneous assistance and enables one person to rely on the future actions of another. The same sort of explanation is needed to account for non-contractual obligations, which arise out of special relationships like those of parents to children and children to parents. Warnock has argued that, if things are not to go so badly as they are liable to do, four sorts of things are needed: knowledge, organization, coercion and good disposition. Among good disposition there are non-moral virtues like industriousness, courage and self-control. But virtues like non-maleficence, fairness, beneficence and non-deception form the core of morality. Morality needs to be made, but it cannot be made once for all. The device of morality is beneficial because of some contingent features of the human condition. Morality may well need to be in part remade as a response to changes in the human situation. (*Ethics*, p. 123).

It has to be admitted that what Mackie and the people he follows say is

eminently sensible. However, we still feel a little ill at ease, because this account of moral principles and values seems to leave little scope for moral reasoning. Just any answer to a moral question is not right, and we all want that the demand for objectivity of moral judgements is linked with our desire for finding a rational procedure for deciding moral questions in one way rather than another.

In his recent book, *Moral Thinking* (Clarendon Press, Oxford, 1981), R.M. Hare argues that the notion of rationality is more promising than that of objectivity (p. 212). In the primary sense, it is thought which is said to be rational, but we can also say that actions are rational if they are the products of thought. R.B. Brandt has given a very good definition of 'rational' in his book, *A Theory of the Good and the Right* (Oxford, 1979). He says that those actions, desires and moral systems are rational 'which survive maximal criticism by facts and logic' (p. 10).

Moral judgements are to be tested both by facts and by logic, if they are to be rational. Hare argues that there are no moral facts additional to ordinary facts. The alleged moral facts are thought to be known through the faculty of intuition. But there is no satisfactory way of distinguishing between the ordinary, empirical, subjective fact that we are disposed to condemn certain actions and the supposed faculty of directly apprehending moral properties (*Moral Thinking*, p. 217). We are rational in our moral thinking, if we make use of all the available and relevant ordinary facts.

To say that fact can be a reason for a moral judgement is not to say that the moral judgement is deducible from the facts. A moral judgement is deducible from a fact only in conjunction with a moral principle. But how can we rationally decide which of the moral principles to adopt? Hare argues that in deciding upon the moral principles we must reason in accordance with the logical requirements generated by moral concepts (p. 218). But what are these logical requirements?

In his long career as moral philosopher, Hare has all along emphasized that, in order to be rational, moral judgements must be universalizable. Arbitrariness in moral judgements is sought to be curtailed by the logical requirement that 'if we make different moral judgements about situations which we admit to be identical in their universal descriptive properties, we contradict ourselves' (p. 21). In consequence of a long process of interaction with the thoughts of other philosophers, including Amartya Sen, Hare would like to formulate the requirement of universalizability in the following way:

> To be prudent is to think of the future states of a certain person as oneself and thus to acquire a concern for the satisfaction of the future preferences of that person. To be moral is, first of all to contemplate the hypothetical situation in which what are actually going to be states of another person would be states of oneself and thus to acquire a hypothetical concern for the satisfaction of the preferences of oneself in that hypothetical

> situation; and then, because of universalizability to find oneself constrained to turn this merely hypothetical concern to an actual concern for the satisfaction of the preferences of the actual person (p. 223).

To put the matter baldly, but not too rigorously, my principle of action becomes a moral principle if I consider not only my own preferences, but also the preferences of others; the reason is that if I were going forthwith to have the preferences which others have, I must now prescribe that they should be satisfied. But morality admits of no relevant differences between 'I' and 'others'. Hence I am bound to prescribe that the question of the satisfaction of the preferences of others should be taken into consideration.

Warnock, Mackie and Hare—all emphasize the role of moral values and principles in ensuring the emergence of the individual from the confines of selfish and prudential considerations. For Hare any preference which can give rise to universal prescription or prohibition is at the basis of moral principle. If anyone acts out of a preference which cannot be universalized we can reason with him by trying to show inconsistencies in his thought. Mackie and Warnock argue that mere universalizability cannot enable us to sort out the morally acceptable from the morally unacceptable preferences. To choose the morally acceptable preferences we have to find out which preferences can counteract limited sympathies.

All the above thinkers leave us ill at ease, because they do not seem to do enough justice to the sense of objective compulsion which we all have regarding the making of moral judgements. Mackie argues that the acceptance of a moral code reflects people's adherence to and participation in a way of life. He contrasts this with the view that the acceptance of a code is based on perceptions of objective values (*Ethics*, p. 36). Hare appreciates that the contrast is not a sharp one and argues that if we have different ways of life we may come to see and certainly describe things differently (*Moral Thinking*, p. 85). If we are not crude empiricists, we will have to admit that the data of experience are organized according to principles which are not directly and obviously derived from experience. Our experience has a structure which is not passively received from outside. But what is the justification for the imposition of a structure that we impose, and why should we not regard this structure as merely fanciful? It cannot be said that a completely satisfactory theory has been given as yet regarding the proper justification of the scientific or metaphysical framworks that we use now or have used in the past.

But the outlines of a solution for the problem of justification of a value system seems destined to run along the following lines. The values reflect a way of life, and this way alone can provide a justification for them. Mackie says that right and wrong are invented. Certainly they are, but they are not a device or a tool external to man but express what we ourselves are. Man, *pace* Hare, is not a bundle of preferences struggling for the maximization of the social utility function. The moral devices, tools and institutions fashion

man's personality, and they already embody man's values and ideals. Man is what he is because of the values he has chosen. Historians, anthropolosists and sociologists have to study man's moral, aesthetic, political and religious values, because they are the facts of which man is made. But why are values grist to the mill of the factual social scientist? Because values are the stuff of which man is made.

But granted that values make man what he is, why is man justified in adopting a system of values he does, in fact, adopt? But how far can we take this demand for justification? I am justified in accepting a system of values if I cannot be I without this system. I am justified in thinking that there are material objects if my whole way of thinking and acting makes no sense without this belief. What other justification can we conceive of or can we even need? We justify a conclusion with the help of premises which appear more evident to us. Those who demand justification of our moral values must ultimately ponder over the following question: which bases would be regarded by them as safe to start from? Justification of values can hardly start from a base where there is no mention of values. Either you get lost in a world where there are no moral values or you manfully struggle in a world steeped in values, though the actual system of values cry out for criticism and transcendence not only through reflective thinking but also through adventurous and resolutely pursued ways of living.

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Book reviews

YASHDEV SHALYA, *Sattāviṣayak Anvīkṣā* (New Delhi: Indian Council of Philosophical Research, 1987), 236 pp., Rs. 75.

The present work from the pen of the well-known philosopher Sri Yashdev Shalya is a work of major significance. In view of the fact that being in Hindi it may not be accessible to many readers, the present review includes a brief summary of its salient features.

Shalyaji's work caps a distinguished series of his earlier writings. He has always been an original thinker, although his initial positivistic tough-mindedness has been increasingly tempered by a growing philosophical culture. He had begun under the strong influence of logical empiricism, expressly styling his *Philosophical Analysis* (1961) 'a work in the empiricist perspective'. Even so he felt dissatisfied with a purely 'sense-based' empiricism, which imported a metaphysical presupposition. *Knowledge and Being* (1967) and *Culture: An Interpretation of Human Creativity* (1969) formulate an ontological and axiological relativism based on the centrality of conceptual determination. Mind and matter were both engulfed in the object, while the subject was reduced to a mere empty shell. In *Object and Ego* (1972), Shalyaji was strongly influenced by phenomenology, but tilted the balance between the subject and the object in favour of the former despite their relativity. The subject was also given an ontological status as a value-seeker. The being attributed to it, however, was conceived not as positive reality but as something to be realized. By the time Shalyaji published his next work, *Man and the Universe* (1985), the change in his ideas was even more marked. He had now imbibed a strong idealistic influence arising from a new appreciation of Plato and German idealism. Some Indian philosophical systems like Sāṅkhya, Vedānta and Buddhism also clearly attracted him. He now attributed an ontic status to knowledge and its objects, values and value-seeking, but conceived being itself in terms of consciousness. The universe here becomes an expression of consciousness, not an unreal accident. Human consciousness is then to be understood as the consciousness-in-the-world, seeking to return to its original nature. The various departments of theoretical knowledge and creativity—science and philosophy, art and religion, morality and society—signify the inward or reflexive return of consciousness.

The work under review moves farthest from Shalyaji's earlier writings. Empiricism and postivism are rejected in favour of rationalism and a kind of transcendentalism which does not denigrate the structured plurality of objects. Logical 'determinations' and the category of identity-in-difference are given a significant role, and so are the 'ideas'. Shalyaji's 'ideas' or *pratyayas* are pure essences revealed in rational apprehension in which subjectivity and objectivity

are correlative, and in which an inherent dialectical tension produces and upward and inward movement, a 'pilgrimage of the spirit'. Despite facing its logical difficulties, Shalyaji does not ultimately reject the concept of the indeterminable. He conceives reality as an infinite whole which is the ground of all determinations, at once immanent and transcendent. The distinction of pure consciousness (*cit*) from the mind (*citta*) is characteristic of much of the Indian philosophic tradition. If Shalyaji welcomes the endless Faustian quest of knowledge and creativity, he also welcomes the Vedāntic quest of returning to the original and recovering the selfless self. In fact, Shalyaji may be said to seek a balance between rationality and spirituality, a synthesis between the great Western tradition from Plato to Hegel and phenomenology and the Indian tradition from the Upaniṣads to Śaṅkara and Kāśmir Śaivism.

The book begins with an introduction which conceives the enquiry into being as metaphysics in the true sense, which makes it neither a supernatural science nor nonsense. Philosophical enquiry pursues the ultimate through reflection over self-transcending ideas. It may be recalled that critical reflection concerning the principles of knowledge and experience was called *ānvīkṣikī* in ancient times and was distinguished from *adhyātmavidyā* or enquiry concerning the self or the inner being of man. One might say that, for Shalyaji, while *ānvīkṣikī* characterizes the method and procedure of philosophy, *adhyātmavidyā* indicates its ultimate objective which is the revelation of the whole through the analysis of its immanent order. The ultimate cannot be determined in conceptual statements but is necessarily connected with their meaning as its transcendental presupposition. It has been conceptualized as *mokṣa*, God, the Platonic God, etc. which have been the unique objects of enquiry for philosophers, though others have attempted to intuit them directly also. Their attainment requires the redresment of the self-alienation of being in the world of existence. Being must be distinguished from the actual or the factual and classed rather as the ideal. While being acquires weight from ideality, ideality acquires reality from its self-sufficient character. This induces an inner tension in being. Existence, on the other hand, is accidental. It belongs to the level of empirical consciousness, the level of psychic and physical being. It may be conceived as a form of the self-alienation of being. What one seeks is, as it were, veiled in what we have. As Kabir said: 'I should be writing letters to my beloved, if he were in some foreign country. How is a message to be sent to one who is ever present in body, mind and vision?'

The first chapter is entitled 'Foundations of Philosophy'. Being was conceived as the object of enquiry in ancient Greece as well as in India. Its highest conception in Greece was that of the most universal form; in Vedānta it was interiorized as the truth of consciousness. In modern philosophy, although Descartes connected being with thought, thought itself was generally held to be grounded in its object. It was only the post-Kantian German idealists who were able to think of transcendental consciousness, a conception which echoes Indian thought. Thought and being, subjectivity and objectivity are

united in the idea (=*pratyaya*), which dialectically posits the indeterminate as their common ground. The idea is not a mere logical form but the emergence of order or structure in the unmanifest absoluteness of transcendental consciousness (*cit*). It follows that the dialectical idea is the proper foundation of philosophical enquiry, which is primarily theoretical but has also real axiological and spiritual dimensions. 'Philosophy includes and transcends theory as well as value-experience (*anubhūti*). It grasps the world in its totality and transcends it' (p. 19) Husserl conceived philosophy as wisdom, but unfortunately limited it to the radical examination of scientific presuppositions. The task of philosophy is wider: 'To see the spectable of the world from the casement of intelligence.'

The second chapter, 'Enquiry into Being', begins by stating that being is the primary given at all levels of the mind, which is characterized by self-revelation and intentionality. Being pervades the mind from within and from without. It is not to be conceived as the property or constituent of something necessarily alien to the mind. It is as internal to consciousness as to the object perceived by it.

The rational determination of being involves the differentiation of the object from the subject and from its environment. This differentiation is not a superimposition or external projection of subjective forms but the revelation of objective essence, which is also the recovery of the latent nature of consciousness itself. A pure object outside determinations cannot be credited with reality since objectivity and determination are inseparable. Thus, all determinate being contains an element of non-being. The ego, in particular, is not only aware of its being but also of its falling short of its ideal.

The next chapter, 'Being and Adequacy', continues the theme of the earlier chapter. Being is revealed not by immediate presentation or practical efficiency but by the sense of constraint, which accompanies determination. Actual existents fall short of their idea, and this deficiency comes to consciousness in the ego. This self-consciousness of being also reveals its essential infinity, which makes its limitations accidental. How infinite being becomes the transcendental ground of delimited objects has been sought to be explained by many philosophies. Shalyaji deems the Vedāntic approach most satisfactory, although he values the approach of Sāṅkhya which he interprets in an original and highly stimulating manner.

The fourth chapter deals with the 'Natural World' and the fifth with the 'Essence of Nature'. Matter has often been conceived in terms of extension, externality, sensuous immediacy or causation. Shalyaji argues that the root of sensuous externality is not sensory but prior to it in the 'world-instinct' (*jagat-pravṛtti*) of the mind, which is the source of the body itself (p. 56). This 'world idea' or 'being-as-the world' (*jagadbhāva*) is a real movement (*pravṛtti*) in real consciousness, and it creates the material world of things through the medium of sense and thought. 'What characterizes matter is not its irreducibility or accessibility to these senses, but its inner emptiness or absolute

externality, generality and quantitativeness' (p. 60). 'Whatever may be the property or quality of matter, if it is defined as an object of knowledge, it will be subsumed in knowledge; if it is not defined as an object of knowledge, no account or definition of it will be possible' (*ibid*). The creative expression of consciousness in nature occurs at various levels—physical, biological and human. In each succeeding level, the governing idea or principle becomes qualitatively different till at the human level the mere idea is replaced by the living mind or spirit (p. 70).

The natural world is the collection of determinate but evolving existents (p. 78). 'Nature as essence or principle is the reality, character and goal of things and the world, it is the indeterminate ground of natural determinations' (*ibid.*). 'Nature in reality is the acceptance of the inevitability and irreducibility of the other' (*ibid.*). Otherness, however, 'can only be the self-determination of the spirit or self (*ātmā*), not an independent principle' (p. 79). Shalyaji interprets the Sāṅkhya to mean that the ego is the object in the apprehension of the other, not the locus of the apprehension. It is nature that is the locus and the ego that is the object in the apprehension of the other. Nature, thus, becomes the indeterminate ground of natural determinations, though it is otherwise determined by the otherness of the *puruṣa*.

As an intelligible order, nature shows the regularity of the causal law, but as a sensible actuality, natural events lack necessity. This shows that as a sensible actuality nature is not grounded in itself. Sense data presuppose an independent ground, which would be sufficient for phenomenal appearance (p. 90). This ground is too deep for determination, but is not unreal. Shalyaji considers various interpretations of 'noumenal' ground, but ultimately votes for a non-dualistic solution which seeks to include the truth of Sāṅkhya within it. 'Thus the ground of the world is not nature or the reality of the other but only the self-alienation of consciousness' (p. 93).

The sixth chapter on 'Essence' argues the priority of essence over accident. It distinguishes three meanings of essence as universal, property or ground, and ideal. These three are distinguishable in appearance but unified in reality. One may, in effect, distinguish two levels of reality, a deeper one of ideal essence and a superficial one of actual existences. Essences are archetypal, and express themselves in creativity and purposiveness (p. 100). The accidentality of existence presupposes essence on the ontic side and freedom or self-dependence on the epistemic side. This freedom attains self-consciousness in man. This freedom, in terms of self-subsistence and self-consciousness, means ideally self-determination in terms of essence or nature with which it becomes self-alienated. Thus, we have freedom as timeless self-determination at the essential level. There is also the search for one's truth at the temporal level of self-alienated existence. Human consciousness is mediated or self-distanced or alienated, but it carries with it the awareness of the possibility of transcendence into immediacy (p. 105). Shalyaji's notion of *vyāvadhāna* is comparable with the Kāsmir Śaiva notion of *vyāvadhāna* or *tirodhāna*, though the two are

not the same. Unlike other things, man is not the mere existential expression of an essence but rather its very source, its free self-realization. In the self-realization of the ego, the object is not the ego in its particularity but in its universality, the essence of the human ego.

The seventh chapter is entitled 'The Essence of the Knower'. Knowledge implies the intentionality of the mind, and to be the knower is to be the introverted spectator of this modality. When the intentional object coincides with the actual object, we have truth; otherwise there is error. The attitude of the spectator turns mental states into spectacles, and is itself the expression of a superindividual or superorganic consciousness (*atimānasika cit*). This is the introversion or self-reflective attitude of the spectator (p. 111). To be a spectator is to return to one's own self, and the essence of the spectator is totally non-objective. The ego is closely related to the spectator but is different. (p. 113). The ego is a unique kind of object in which all other objects—experiences and notions—are focused and grounded (p. 115). There is an element of introversion in the ego which distinguishes it from all other objects, but it is not absolute as in the case of the spectator. The spectator is not the other of the object but its illuminator. Nor does it stand in any need of the object. Nor should the spectator be regarded as a mere presupposition of the object. It is apprehended intuitively. It is known in I-consciousness but also as its intuitable transcendent ground (p. 119). The Vedāntic concept of *śākṣiṇ* is comparable here, but Shalyaji holds that for man such pure spectatorship remains a limiting concept, though it implies that, even in its subjectivity, the mind can transcend the limitations of the ego and attain to universality (p. 123).

The eighth and ninth chapters deal with value as subjective and objective reality. There is always a gap in knowledge between the nature of the object and what we apprehend of it. This sense of limitation in consciousness is the seed of value-seeking, which arises from the apprehension of non-being and is oriented towards being. Non-being is rooted in consciousness. Whether it is physical need or knowledge or contemplation, the same logical structure is to be found in them, viz. the awareness of a lack of non-being and the search for being. The first of these three dimensions belongs exclusively to the level of existence, and hence does not evoke value-seeking. Knowledge-seeking becomes value-seeking most fully, when it seeks the source of knowledge itself (p. 127). Value-seeking is also available at a lower level, when the sciences seek the truths hidden in different specified regions. The value, sought in the search for truth, is the purity of the spectator or knower, in the search of beauty it is a felt meaning, in the search of the good it is the dedication of the emotive-conative mind to the moral end. In every case, the source of value is the inward and upward movement of the mind. All value-seeking is ultimately a seeking of the self (p. 132).

Value is to be distinguished from facts for which it sets a standard. The standard becomes self-aware in man, and is termed value. The emergence of

value in this sense occurs in history. What appears as an object of seeking in time could not but belong timelessly to the nature of original consciousness. How, then, would creation be understood with its veiling effect except as a preface to the emergence of value-seeking which would indicate the return of consciousness? (p. 144).

The tenth chapter on the indeterminate argues that determinations indicate a transcendent indeterminate, but do not form any chain or order with it (p. 151). Cognitions and objects occur only as determinates, the indeterminate lies beyond them. It has been variously termed as *asat* or *śūnya*, the good or the absolute. Its purely negative description has implications about creation and the nature of the created world. The limitations of objects or subjects do not make them unreal, although they point to relative absolutes. Although a requirement of thought, the noumenal indeterminate is neither simply an intellectual construct nor a matter of empirical or practical activity. Such activity involves the use of speech and thought which transcend themselves in intellectual intuition. In science knowledge transcends itself in terms of the object. In philosophy the objects are traced to basic concepts, the concepts to basic tendencies or a priori modes of consciousness (*cidvṛttis*), and these to pure consciousness (*nirupādhika caitanya*) (p. 161).

The eleventh chapter on the human principle begins by mentioning the duality of man as subject and object. The subject is revealed in at least four levels—physical, mental, rational and transcendental. While the last is identified with the *ānandamaya kośa*, Shalyaji holds that it is the third or the *vijñānamaya kośa* which presents the witnessing subject. The various levels of subjectivity depend on the character of the seeking with which the ego is identified. The nature of the subject is obscure, not merely because it is apprehended through introspective reflection and hence indirectly as an object; but because it has an unfathomable depth and subtlety. Different cultures may be defined as different interpretations of human nature just as an individual's life may be considered the successful or unsuccessful realization of one such view. The conception of man points a standard or value to be pursued. It has been formulated as peace or happiness, 'freedom' or 'authenticity'. Authenticity is, in fact, required for the authentication of the standard itself. Inner authority derives from the identity or immediacy of the mind with its essence, the essential self. In the empirical condition human self-consciousness is mediated by many accidents (*upādhis*). The real nature of the self is unavoidably indeterminate, all determination being accidental (*aupādhika.*) While such transcendentalism is well known to belong to some Indian philosophies, Shalyaji curiously attributes it to Hegel also (p. 167). In fact, Shalyaji does so not because Hegel and Vedānta, for example, coincide in this respect, but because Shalyaji's conception of human ascent and literation tends critically to unite them. He is critical of the usual conception of *mokṣa* and Yogic absorption, holding that the approach to the indeterminate is along the ascending hierarchy of ideas. He suspects that Indian spirituality is deluded

in believing that consciousness can be wholly liberated from the dimension of extraversion. It is the ineradicable duality of human consciousness which invests it with value-seeking, the seeking for its own ideal nature. In this approach which is towards the absolute, the lower categories are not simply transcended; their essential truth is retained within higher ones, so that human history itself may be read as a spiritual pilgrimage (p. 171). The absoluteness of the spirit towards which the pilgrimage moves is not simple formlessness as Indian spirituality is often said to believe but the fathomless and shoreless infinity of forms, which is the goal of endless progress.

The twelfth chapter on culture argues that society is a psychic reality like the individual, though its strands are visible in the supra-individual species of mind also. It is psychic in the sense that its emergence and continuance depend on the exercise of the will. It is an ordered system arising from the rational mind, not biological instinct. To justify the notion of society as the supra-individual mind, Shalyaji finds fault with the instinctive notion of the individual mind itself. He defines the self or individual as the objectively mediated self-awareness of thought. Individuality, thus, is not a bio-psychic fact but a notion of the self thrown up in willing or agency and serving to superintend the organization of the bio-psychic material (p. 178). The mind is simply the unity in difference of ideas (p. 180). Its supra-individual character is illustrated by language.

Shalyaji finally defines culture as a psychic structure or social personality (p. 183). Its supra-individual character does not destroy the freedom of the individual mind. Value-seeking and freedom are equally woven into the structure of both the individual as well as the social person. It is unnecessary to add that Shalyaji's account of society and culture strongly echoes Hegel's account of the objective and absolute minds.

The thirteenth chapter on history begins with a consideration of time which is characterized by irreversibility and evolution. History begins with man, and may be considered as the pilgrimage of humanity or the world. If culture conceives value in the social dimension, cultural history is the realization and discussion of that value (p. 197). Human history or world history is the development of diverse cultural styles (p. 200).

The fourteenth chapter on natural science is written from an essentially Platonic point of view. Science does not seek to subsume events under a pragmatic order, but looks at them as illustrating universal principles. It presupposes that the given merely expresses a reality, which can be grasped in terms of a pure mathematical language. This quantifiability may be said to be the pure essence of sense-objectivity. In seeking the essential and universal order underlying the sensible world, science is similar to philosophy but differs by not being so general (p. 208). In any case, science presupposes a philosophy which Shalyaji would call Platonic (p. 210). Science could also be called a presuppositionless philosophy of nature (p. 211).

The last chapter is concerned with art. Art is to be distinguished from

cognition as well as from the subjective experience of pleasure and pain. It is rooted in sentiments and imagination. The artist transcends the subjectivity of feeling by becoming its spectator. Art may be defined as the apprehension of the subject in its universality. Although the notion of subjective universality is reminiscent of Kant, Shalyaji thinks of the artist as the selfless spectator of the meanings latent in a specific subjectivity with which he is imaginatively identified. This subjectivity is endowed with specific emotional possibilities. He intuits the inner meanings of the situations evoked imaginatively. The subjective universal is not like the objective universal. While a particular object is a sensible existent, the objective universal is an intelligible essence devoid of existence. In contrast, the subjective universal is a particular subjectivity which is imaginative, not real. This lack of reality is nothing except the lack of existence. The imaginary subject is as specific as a real one, only it is not endowed with ego-consciousness.

Shalyaji points out that the symbolism of art is distinguished by its uniqueness and untranslatability. Even language suspends its principal denotative function in poetry. Recalling Hegel, Shalyaji says that art is the expression of the absolute through the medium of sense. 'Art is thus the contemplation of subjectivity as an object through the medium of the imaginative idea' (p. 228).

Shalyaji has reared an imposing conceptual structure. The pure *cit* is the creative ground of all things, and is being in its purity. The hierarchical world of *pratyayas* unfolds its infinite structures, and serves as the archetype of the temporal world of actuality. As self-conscious subject and object, man is led to seek his own ideal and real self, and this quest is expressed in the realms of culture. Philosophical contemplation is the highest life.

Concerning the infinite, Shalyaji appears to seek a position which resembles both Hegel and Vedānta. He generally adopts a Hegelian logic, but in the ultimate analysis his experience is Vedāntic. In accepting 'intellectual intuition', Shalyaji, in effect, goes beyond the narrow limits of rationalism.

One may disagree with Shalyaji as a whole or in parts, but it cannot be gainsaid that he has succeeded in producing an outstanding work of far-reaching importance marked by subtle originality and impressive sweep.

Allahabad G.C. PANDE

SURENDRANATH DASGUPTA: *Natural Science of the Ancient Hindus*, ICPR Series in Philosophy of Natural and Social Sciences (New Delhi: Motilal Banarsidass, 1987), x+99 pp., Rs. 50.

Here is an unusual publication. Professor Surendranath Dasgupta was one of this century's most outstanding scholars and thinkers who left a deep imprint on the course of Indological studies. Exactly 'three scores and ten' years ago,

he wrote two papers to shed light on certain key scientific concepts from the ancient Indian point of view. Whatever was available on Indian thought in English was by western scholars, and, thanks to the efforts of scholars like Monier-Williams, Max-Müller, Paul Deussen, etc. a lop-sided, other-worldly, and highly spiritualized image of Indian ideological tradition was already in the process of taking roots. The request which led to the writing of the second of these papers could well have been prompted by a desire to know whether ancient India had any scientific notions at all. Calcutta University was to publish these two papers in a book form but, for unspecified reasons, did not or could not. The doyen had hoped to make 'considerable additions' in the second edition. In the event, even the first edition of such highly significant writings never saw the light of the day. Later, Prof. Dasgupta, who was about to leave for Cambridge at the time of writing the undated Preface, himself became too occupied with his monumental multi-volume, *A History of Indian Philosophy*, and other works to come back to these papers. We are beholden to Dr (Mrs) S. Dasgupta for preserving all the unpublished typescripts of the great savant so carefully and also for agreeing to put them in charge of the Indian Council of Philosophical Research. Bound volumes of these typescripts are available to researchers at the Butler Palace library of the ICPR in Lucknow. Prof. D.P. Chattopadhyaya, Chairman of the ICPR, deserves our thanks for publishing these papers now, their relevance being as much today as it was seventy years ago. Well-known scholar of ancient Indian science, Dr Debiprasad Chattopadhyaya, has edited the volume.

The monograph contains, besides the two papers on scientific concepts, an Appendix on the Sāṅkhya theory of *tanmātras*. The second paper, 'Theories of Cosmic Changes', was written in 1915-16 under the title '*Pariṇāma* and Evolution'. Prof. Dasgupta attached greater importance to it. It attracted the admiration of Tagore, Jagdish Chandra Bose, Asutosh Mookerjee and John Woodroff, presumably because it brought to light hitherto inadequately understood facts. It is really a survey of ancient Indian thinking on the nature and character of the gradual changes which have finally led to the emergence of the natural world as we find it now. Sāṅkhya and Vaiśeṣika, being more concerned with a scientific understanding of the phenomena, understandably occupy the centre stage, though the survey starts with the Vedas and includes even medical schools. Since the *tanmātras* are central in the Sāṅkhyan explanation of the world and since Prof. Dasgupta has taken great pains to elucidate its mechanics in modern terminology, an Appendix further elaborating their true nature has been added. However, Prof. Dasgupta makes no mention of the Appendix in his prefactory remarks, and it is not clear how it came to find a place in this volume.

The first paper, 'Matter and Motion', could have predated the other since, according to the author, it was lying unpublished with him, and was added to the second paper to make one volume of writings on ancient Indian scientific concepts. Prof. Dasgupta admits at the outset that 'the Hindus never busied

themselves about the investigation of the laws of nature except in so far as it was connected with the general philosophical speculations' (p. 31). While it will not be feasible to reconstruct a 'Hindu physics', 'one can collect passages from different works to demonstrate the theories of matter and motion of the Hindus'. This is what he has really attempted in this highly knowledgeable paper. Beginning with Patañjali's *Mahābhāṣya*, which may well be the earliest text dealing with, *inter alia*, matter or mass, he goes on to summarize the views of Helārāja, the Buddhists, the Sāṅkhya, the Jainas, the Nyāya-Vaiśesika, the Vaiṣṇavas and others. He has discussed several different ways of regarding matter, sometimes found in the same text.

This slim volume is a model of succinct writing. A serious-minded researcher can find enough guidance in these papers to produce outstanding dissertations. A renowned Sanskritist and a Vedic scholar virtually from childhood, Prof. Dasgupta was quite at home in the western tradition of ideas, religio-philosophical as much as scientific. His summary of an *E.R.E.* article on European atomism (pp. 29-37) shows not only his interest but also a critical-analytical understanding. He wrote with great authority on grammatical texts like the *Mahābhāṣya* and *Vākyapadīya* which were hardly known outside the highly traditional circles at that time, and are not fully made use of even today. It is just not possible to do justice to such a work in a short review. Every word has to be read and savoured.

The book provides a good index to Prof. Dasgupta's approach to Indian thought and to his own role as its historian. His commitment to an objective historical understanding was total. Unlike some others, he was not enamoured of the spiritualist, mystical or traditional aspects.

> When we look at the *dogmatic* grip of the scripture over the popular mind and the *slavish* admiration and veneration of the people for them [he declares]...an honest doubt creeps into our mind, whether we really possessed any true life or whether *boasted* antiquity was as lifeless as the rocky walls of the Himalayas... (p. 51. Italics added)

A questioning (i.e. scientific) attitude of mind would take us to:

> human beings with their doubts and ignorances, men engaged in the honest endeavour of seeking after truth steering in an ocean of darkness amidst countless failures breaking upon them. It is just when we come here that we feel that we are moving among men and not among mummies and curios of an old museum. (pp. 51-2).

No wonder in his *History* he passes no value judgements, shows no preferences, accords equal respect to all schools and sects, and sees no reason to read spirituality in every notion and idea.

A word on the title of the book may not be out of place. The second paper as well as the Appendix quote from Brojendra Nath Seal's *Positive Sciences*

of Ancient Hindus which was first published from London in 1915. When Prof. Dasgupta says that 'I have purposely omitted many interesting empirical facts which some other writers had mentioned before', he is evidently referring to Seal's work as also P.C. Roy's *Hindu Chemistry*. He chose the title for his own monograph in a hurry, and was not himself happy with it. Was it really necessary to retain it? Could it not have been changed, of course with Mrs Dasgupta's permission, so as to delete both 'Natural Science' and 'Ancient Hindus'? After all, he was dealing not with sciences but with theories and concepts, and his field included every ancient Indian thinker, not only the followers of the Vedic tradition who are usually known as Hindus.

Dr Debiprasad Chattopadhyaya has done well to provide a number of 'Editor's Notes', so much needed to clarify many points. As he himself observes in note 38, Prof. Dasgupta left the manuscript 'apparently without thoroughly revising it', making it his task to take care of the lacunae. Some errors, mostly typographical, have crept in, but they can be removed in the next printing. However, one wished that the editor had shown greater warmth for his subject. In note 6, he wholly needlessly brings in Vasubandhu's *Vijñaptimātratāsiddhi* when he failed to locate a reference to *Abhidharmakośa* in the printed copy in his possession. That the subjective idealist Vasubandhu took an anti-atomistic position does not mean any thing when one is talking about the earlier, realist Vasubandhu, as Prof. Dasgupta was doing. Dr Chattopadhyaya's note almost suggests that Prof. Dasgupta misunderstood Vasubandhu! Similarly, in note 33, Prof Dasgupta himself acknowledges his indebtedness to J.H. Poynting's article in the *E.R.E.*, but Dr Chattopadhyaya felt it necessary to add: 'In fact, the entire section is a summary of this article usually retaining its original language.' In what way does additional remark supplement the author's own note? On the other hand, it is almost an assersion.

I for one would have felt grateful if Dr Chattopadhyaya, a known specialist of the subject, had contributed an editor's preface to provide further guidance to younger generation regarding ancient Indian science. So much has been published in the last few decades with direct bearing on the line in a way inaugurated by Prof. Dasgupta as far as English language is concerned. Students of philosophy deserved being told about them, and Dr Chattopadhyaya was the fittest person to do so.

University of Sagar, Saugar PRATAP CHANDRA

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